HUMANIZING INFORMATION DESIGN: A MODEL

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PROLOGUE

My first full-time job out of college was as a copy editor at the St. Cloud Times, a daily newspaper with a circulation of about 37,000 at the time. When I was first hired, I was scared out of my mind. I had had one year of experience at a college weekly newspaper under my belt, and that experience was not exactly adequate in preparing me for the chaos and extreme adrenaline levels required to meet deadlines at a daily paper. Among my new duties included taking a big, blank InDesign document of several pages and transforming them, step by step, into an entire section of the newspaper. And then coming back the next day to do it all over again.

I was young and adaptable. I quickly adjusted to my new lifestyle, waking up at noon, heading into work in the late afternoon, staying past midnight to see the very first printed pages come off the press, eating dinner at 2 a.m., usually going to bed around 6 a.m. I was also a quick learner, catching on to the software and the ridiculously hectic, no-room-for-errors pace with which I needed to use it. It was one of the most stressful times of my career. It was also one of the very best times of my life.

Within one year, my position evolved into the more design-intensive role of presentation copy editor. I was assigned to special features sections and encouraged to explore alternative story forms and to see visual potential in news articles that were not accompanied by photographs. Visuals were important, but just as important were the storytelling methods I applied by editing others' work. Sometimes a visual was a quote pulled from a story and given a special typographic treatment. Sometimes it was an illustration I created that was directly inspired by the content. Sometimes it was a matter of laying out the text in an unexpected-but-still-legible direction. At all times, my design work was executed with a diligent rhetorical focus on the reader.

Certainly there were colleagues who considered my position to be that of an advanced illustrator or story accessorizer, mere activities that aim to make an otherwise boring story "look pretty." But through it all, my design team and I championed the philosophy that the design must be solid *and* must organically flow from the content. There was no

room for taking unnecessary liberties with the content, dressing it up deceptively so as to make it seem more appealing to the reader. There *was* a need for understanding that not all stories can be told through traditional methods; in fact, through an understanding of non-traditional options for presentation, new methods of inquiry, knowledge-generation, writing, and communication could emerge.

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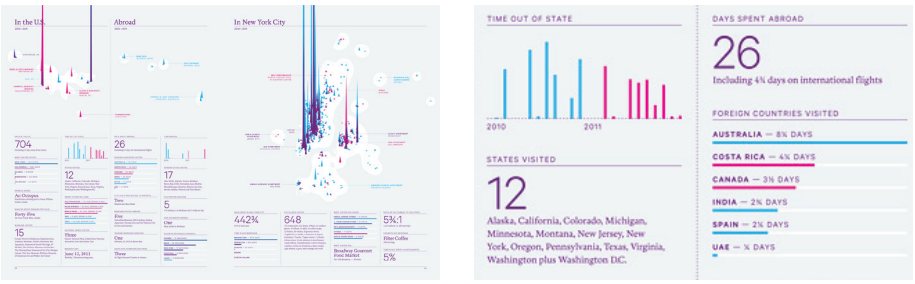
In late 2011, now working at the University of Minnesota Press, I was introduced to the field of the digital humanities via a book we published, *Debates in the Digital Humanities*. This is a 500-plus-page book about this emerging field and its efforts to rejuvenate higher education and integrate new and emerging technologies into the classroom. The book's emphasis on innovation in terms of not only tools but also new ways of thinking intrigued me from the beginning. Its ability to question everything about the foundations of knowledge representation resonated with me and seemed to be connected to my design work. Digital humanities scholars (in particular, Johanna Drucker, who is Bernard and Martin Breslauer Professor of Bibliography in the Information Studies department at UCLA) were even bringing discussions about graphic design and data visualization into the field.

One of my responsibilities at the Press is to edit and solicit content for the Press blog. I had been drawn to scholar Johanna Drucker's *Debates in the Digital Humanities* essay, "Humanistic Theory and Digital Scholarship," and the way in which it incorporated information design with an emphasis on humanistic elements. I had also held in high esteem the work of Nicholas Felton (examples: Figs. 1a and 1b), a designer who catalogs his life's experiences, routines, and habits in visualized *Annual Reports*[1]. He takes such information as the number of coffees he's consumed, the places he's traveled, milestones such as a new apartment or attendance at a wedding, within a single year's time and designs them into these beautiful, graphic "reports." At the time, these reports seemed to me to bring physical form to Drucker's arguments. I asked her to write about Felton—and soon discovered that I couldn't have been more wrong.

1 More examples: feltron.com.



Figures 1a and 1b. From left: a page out of Nicholas Felton's 2010/2011 Feltron Biennial Report; a closeup of that same page (Feltron.com).

I published Drucker's blog post, "Representation and the digital environment: Essential challenges for humanists," on May 16, 2012. I was surprised to discover that Drucker had considered Felton's work "a performance, nearly parodic, of the process with which I take issue."[2] Drucker's theory was more complex—and by extension, more intriguing—than I had initially realized. I wanted to learn more.

...

In the fall of 2012, I was introduced to the field of design thinking. Again, I saw connections between this field and my design work and philosophy. The field of design thinking encourages a problem-solving approach to social, business, and other problems (i.e., non-traditional design problems) in a manner that directly engages the end user. I realized that specific models of design thinking essentially gave a physical form to the process I have adopted. Increasingly, as I immersed myself further in information design, the digital humanities, and design thinking, my intuition told me that there were connections among these three areas that were worth exploring. What follows here is my journey of discovery.

2 See: http://www.uminnpressblog.com/2012/05/representation-and-digital-environment.html.

"There is nothing natural about information.

Information, no matter what it is called—data, knowledge, or fact,

song, story, or metaphor—has ***always*** *been designed."*

—Brenda Dervin, Information Design *(1999)*

INTRODUCTION

Information design, simply put, is the act of assembling and presenting data. The term "data" might be commonly recognized as a set of fixed pieces of information, such as numbers, percentages, time, or locations. But what, exactly, is the nature of data? How is it captured, and how can its accuracy be assured?

This thesis is concerned with the myriad ways in which humans make sense of data through graphic presentation. At its essence, a number is indeed a form of design in the sense that it serves as a presentation and representation of what exists; we might see a few pennies lying on a table, or "3" pennies lying on a table. More broadly, what humans do to assign order to multiple sets of data, whether they might surround a particular time, space, event, or other phenomena, in all of its chaos and complexity, is worth examining. Examples of information design can be as simple as a bar graph or pie chart, as mainstream as a transit map, or as renowned as artist Maya Lin's Vietnam Veterans Memorial in Washington, D.C. (which presents names of those who perished according to the dates and times of their deaths rather than by standard alphabetized means). Essentially, any concentrated attempt to present a set of information with the goals of communication and edification can be deemed *information design*.

Some commonly recognized terms that describe information design include *infographics*, *data visualization*, *information visualization*, and *data journalism*. This thesis considers under the umbrella term *information design* any graphic expression that falls into any of these four categories. Infographics have been appearing in newspapers since at least the 1930s, and the *USA Today*, for example, was an early purveyor of information design with its innovative use of front-page "Snapshots"[3] (Bogost). Today, the *New York Times* produces plenty examples of alternative story forms and infographics, and the *Star Tribune* employs a data visualization reporter who uses the free tool Tableau to publicly display a database of, for example, Minnesotans deemed too dangerous to carry a gun[4].

In higher education, the ability to design information is in some ways being taken so far as to lead scholars in the field of the digital humanities to question the nature of the traditional written essay. They wonder whether some means of presenting information other than a traditional paper or essay would be more effective in some instances and ought to be activities that are encouraged in relevant fields to greater extents (Sample). Johanna Drucker takes this idea further in advocating for a stronger integration of humanistic inquiry and information design. All data in its very essence has germinated from human activities that have become systematized and recorded (not always accurately) in numbers and words. I can say I live eight miles from where I work, but that information is only significant when taken in its situational context: Is it eight miles because I must rely on roads that do not represent a straight line from one location to the next? Do I have easy access to public transportation or a bike path that make the distance longer? Does the route have a toll bridge? Does the shortest route also tend to be extremely busy, adding time to my daily commute? Is "mile" completely accurate or would some other measurement (25 minutes away) better represent the distance in some contexts? Such details are significant to understanding the measurement in terms of my experience with it. Drucker maintains that such pieces of information often get lost in traditional information design.

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3 *USA Today* now posts its "Snapshots" online: http://usatoday30.usatoday.com/news/snapshot.htm.

4 See the *Star Tribune* database compiled by Alejandra Matos, 18 Feb. 2013: http://www.startribune.com/local/191481611.html.

For purposes of this thesis, the field that Drucker represents—digital humanities—has similarities to the field of design thinking, a problem-solving process. Both fields prefer to be rooted in practices that encourage the creation of new tools, models, and ways of thinking and representing knowledge. The digital humanities and design thinking are essentially similar in structure, and their similarities will be explored in greater depth in Chapter 3. As a model, design thinking is made up of distinct steps that include information gathering, idea generating, prototyping, and reiteration. The field's application to social, business, and other problems that do not fall into typical design categories has emerged with fervor in the past two decades. Some see "design thinking" as a much-hyped movement that will disappear with the next new buzzworthy fad. Some criticize it as mere common-sense thinking. Nonetheless, Stanford University has created a design school ("d.school") to elevate the field, and other institutions have followed.

This thesis proves that Drucker's approach to humanistic inquiry can be made accessible to information design projects through the development of a *Model of Humanized Information Design Thinking*. This model is informed by the fields of design thinking and digital humanities. It combines the structure of exemplary design thinking models with the goals of the digital humanities to document the process of information design. It is a "humanized" model rather than "rehumanized" because its foundational philosophy is such that information at its core will be treated as uncertain—an essential shift away from the certainty of *data* to the uncertain, situationally contextual essence of *capta.* This distinction shall be discussed in more detail in Chapter 3.

Andrew Blauvelt writes in *Graphic Design: Now in Production* that about 30 years ago, the "paste-up" artist, or artist concerned with graphic design production, was mired in "a menial phase of the design process devoted not to high-minded forms and ideas but to hands-on execution" (9). When desktop publishing tools such as QuarkXPress and InDesign emerged that digitized the manual paste-up process, the design field grew substantially. Now, thanks to the continuing evolution of such tools, "anyone (can) take up the tools of creative production" (9). Desktop publishing tools have since expanded to include information visualization tools such as Tableau, Google Fusion Tables, and

IBM's Many Eyes —which, unfortunately for the creative aspect of the design field, add a dimension of automation to the design process. On the one hand, automation makes a complicated process accessible to the non-expert designer. On the other hand, the process of automation strips information of its inherent humanized origin.

On the following pages, this thesis will begin by framing information design, providing a context for an information design model by briefly studying historic and contemporary examples. It will go on to analyze design-thinking models and their strengths and limitations with regard to information design thinking. The digital humanities will be discussed as an interdisciplinary field that can inform and inspire information design thinking processes. Throughout, we shall explore two case studies, one in which information design was an unprecedented outcome and one in which *humanized* information design was a specific goal. Finally, all facets of this project will be synthesized to create a model of the humanized information design thinking process.

Two things are significant for the reader to note: One, this paper strategically switches between third-person and first-person voice. First-person is only utilized when necessary to explore case studies that the author was directly engaged in; third-person voice appears in all other areas. Secondly, this paper displays both footnotes and a bibliography. This is also strategic in the sense that footnotes appear when a one-time reference is necessary. Bibliographic references appear when they are used frequently or when they illustrate a broader conversation.

PART I:
CONTEXTUALIZING INFORMATION DESIGN

CHAPTER 1: AN OVERVIEW OF INFORMATION DESIGN

Though information design has evolved over time, the practice is nothing new. One of its earliest and most canonical examples is London physician John Snow's cholera map of 1854 (Fig. 2) in which Snow marked all instances of the disease's outbreak on a map; this led him to discover connections between specific water sources and clusters of the outbreak. In its time, the dot map was innovative in the sense that it successfully portrayed a connection between water source and cholera cases.

Information design examples continued to be realized in maps and charts until the 1950s, when the first electronic computers introduced a need to process large amounts of data with speed (Drucker, "Graphic Design"). Of course, since then the Internet has virtually made that need all the more apparent to the mainstream public. As Richard Saul Wurman put it in 2012: "There is a tsunami of data that is crashing on to the beaches of the civilized world" (Rendgen 39). Even more recently, the publication of sites such as www.data.gov and Wikileaks have made crucial sets of information that much more available to the public.

It must be said that just because we *can* use computerized tools to comb through multitudes of information doesn't mean the processes of learning, understanding, and designing information have changed. Brenda Dervin writes, "information design thus far offered by the new technologies is not that much different from that made possible by the

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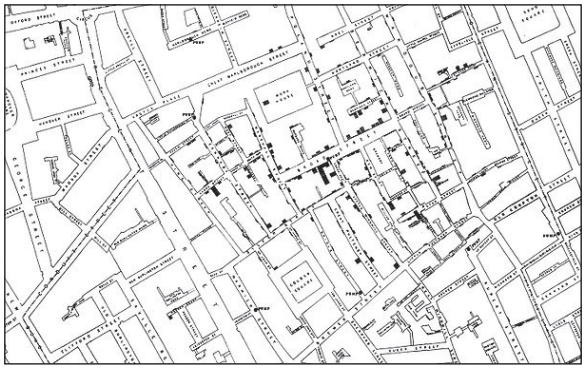


Figure 2. John Snow's cholera map (1854) helped determine the source of a cholera outbreak in a London neighborhood (Creative Commons).

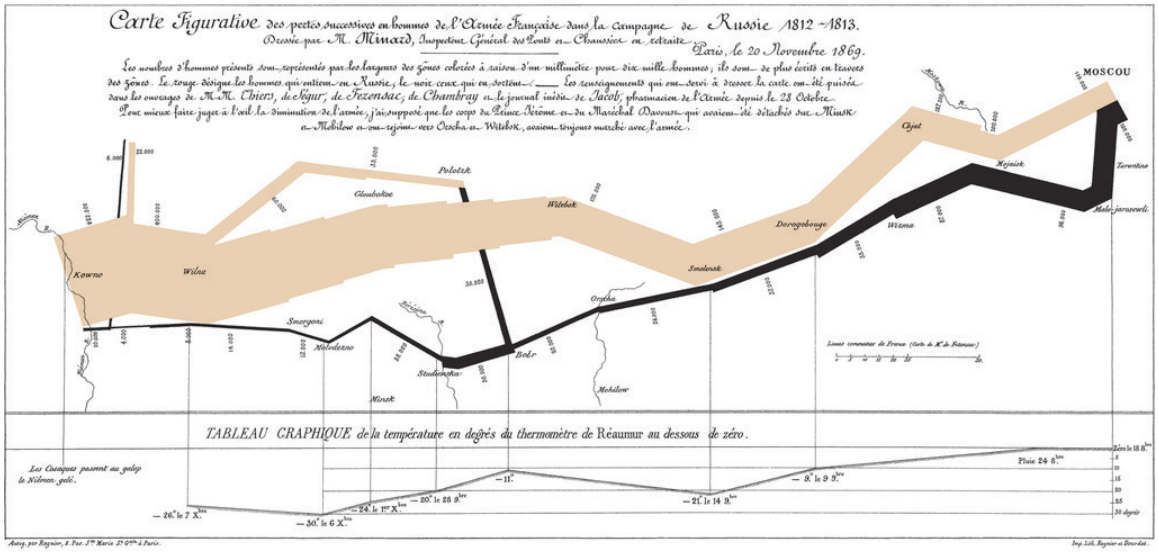


Figure 3. This 1869 map by Charles Minard shows the number of men in Napoleon's 1812 Russian campaign army and how those numbers fluctuated—as well as how the temperature fluctuated—over time, valuing data over geography. Source: Wikimedia commons, http://en.wikipedia.org/wiki/File:Minard.png.

old technologies or, since early history, by nontechnological human practices" (Jacobson 36). One cannot assume information design to be a new or emerging practice, though it might feel that way because new technologies and software have allowed it to evolve in innovative ways.

When many people hear the term "information design," they initially think of Edward Tufte, a statistician and Yale professor who is considered a pioneer in the field. One example of information design he considers to be one of the best ever produced is Charles Minard's pencil-and-paper 1869 flow map (Fig. 3) of Napoleon's Russian campaign of 1812, which depicts not only geography but also the size of the army and how that changed, as well as how the temperatures that army encountered changed, in effect adding another dimension to the geography. Another, more contemporary, example Tufte analyzes in his book *Visual Explanations* is an animation-based vision of a severe storm cloud (Fig. 4), which uses new technologies that support different forms of information representation. All of this is to say that information design need not necessarily require complex technologies. The idea and the content have always been the key determinants that drive the design.

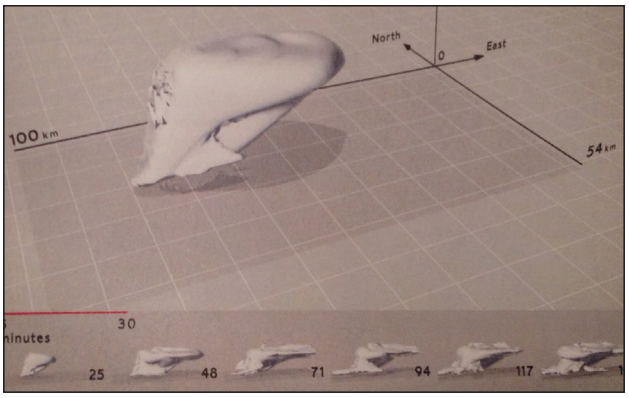


Figure 4. Tufte's redesign of an image that originated at the National Center for Supercomputing Applications shows the scaling of a severe storm and helps dequantify scientific images (Screenshot, *Visual Explanations*, 23).

Alberto Cairo, a professor of Information Graphics and Visualization at the University of Miami, is another such well-known figure in the field. Through the University of Texas, he organized the two first known journalism MOOCs (massive open online courses) of their kind. Both focused on the creation of infographics, and both filled up within very short time periods, the first allowing up to 2,000 students and the second, 5,000 (Martinez, "Knight Center"). His courses place primary emphasis on developing a means of thinking about information; any emphasis on learning new tools in order to do so isn't a major factor for him. "How to structure information in a way that a particular audience can understand . . . has nothing to do with the software, as it can be done with pen and paper. Software comes later" (Martinez, "After"). The sheer demand for his courses demonstrates a publicly recognized need to handle complicated data sets in ways that require examination.

Now, rather than turning to traditional methods of information design, a galaxy of possibilities exist to immediately communicate time, scale, space, and numbers in new and innovative ways. The 2012 volume *Information Graphics* compiles perhaps one of the most complete collections of examples of information design. In it, graphics are classified into four sections: location, in which elements are organized spatially and often on maps; time, which synthesizes data in chronological order, often charting it on a timeline;

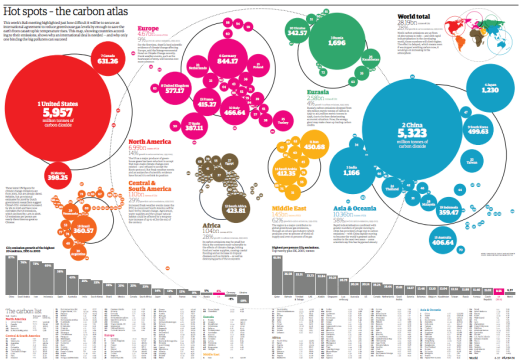


Figure 5. Hot Spots—the Carbon Atlas. In The Guardian in 2007; found in Rendgen, pp. 140-1; screenshot found at http://image.guardian.co.uk/sys-files/Guardian/documents/2007/12/17/CARBON_ATLAS.pdf.

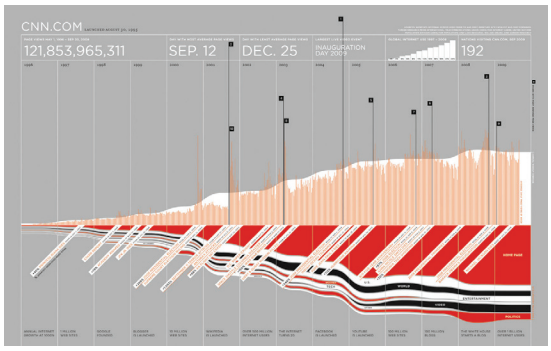


Figure 6. CNN.com Traffic Analysis created in collaboration with Nicholas Felton. Appearing on CNN.com; found in Rendgen, pp. 290-1.

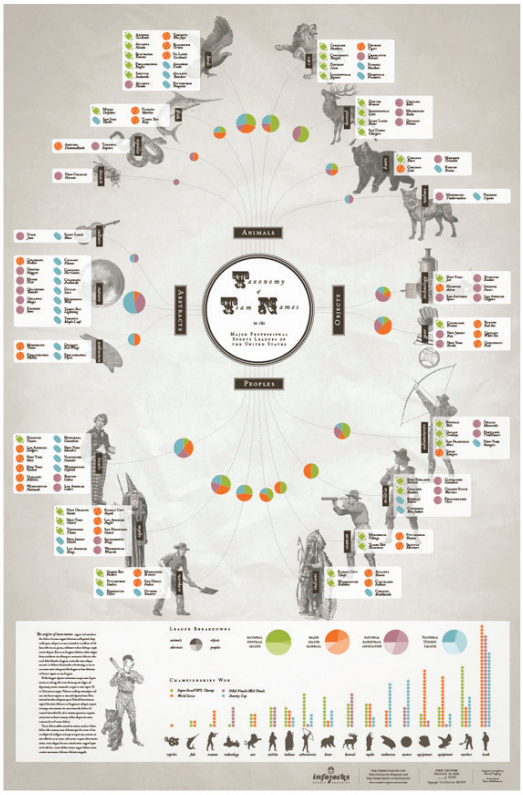


Figure 8. Taxonomy of Team Names. Image from Infojocks.com; found in Rendgen, pp. 452-3.

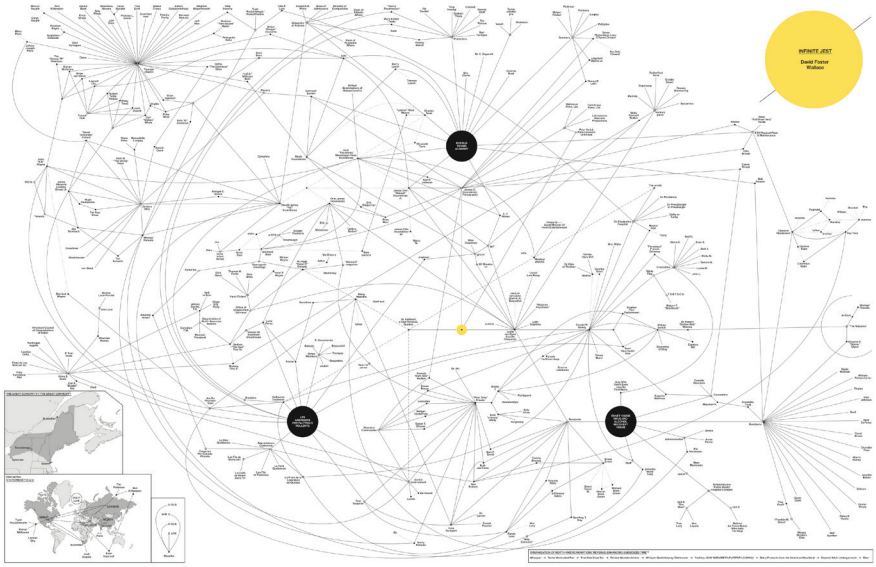
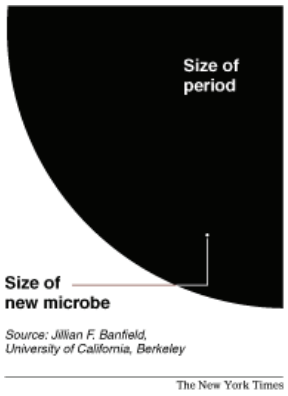


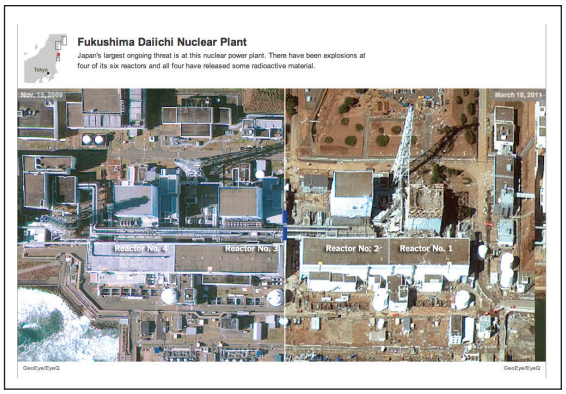
Figure 7. A character diagram depicting David Foster Wallace's 1996 book *Infinite Jest* (Image source: http://sampottsinc.com/ij/. Also found in Rendgen, pp. 356-7).

category, which organizes elements into classes; and hierarchy, in which elements are ranked in order of priority. Examples include a Carbon Atlas, or a map of each country in the world scaled according to how much carbon dioxide emissions it produces, rather than by land mass (Fig. 5); a chronological history of website traffic to CNN.com from 1996 to 2009 (Fig. 6); a diagram of every single character in David Foster Wallace's giant tome *Infinite Jest*, laid out to show relationships and connections among each (Fig. 7); and an iconic classification of the taxonomy of professional sports team names (Fig. 8). All graphics included vary widely in their degrees of serious and casual subject matter. They serve to show how far designers have come since the days of designing information in simplified bar graphs and pie charts.

Mainstream and contemporary examples of information design are commonly recognized in print and electronic journalism. *USA Today* and the *New York Times* were the earliest journalistic proponents of static information design. Between 1965 and 1980, the *New York Times* was extremely prolific in infographics production, and went on to launch a Visualization Lab in 2008, in which readers could make their own information visualizations out of datasets supplied by the *New York Times*. As Ian Bogost writes in *Newsgames*, the lab was terrific in theory but less insightful in practice: "The mere availability of data is not enough to qualify as good journalism" (59). Information on its own—without context—has no meaning for the user.

The *New York Times* has been heralded as a frequent publisher of innovative information design. From a static graphic depicting the scale of the world's tiniest form of life by showing its size relative to the size of a period at the end of a sentence (Fig. 9) to a more recent interactive satellite view of the Fukushima Daiichi Nuclear Plant before and after Japan's catastrophic 2011 earthquake (Fig. 10), such work serves to take modes of storytelling to newer, more edifying, and arguably more effective levels. Notably, as *Times* graphics editor Amanda Cox mentions in a keynote speech at the 2013 OpenVis Conference, there is not—and by design, should not be—a regular template that one can use whenever encountering an opportunity for information design. Each data set has a unique set of characteristics and is open to being presented through means that are just as diverse





Figures 9 and 10. From left: Graphic by William J. Broad showing scale of a new microbe compared with the size of a period at the end of a sentence in the *New York Times* (http://www.nytimes.com/2006/12/23/science/23microbe.html); screen shot of interactive infographic map of Fukushima Daiichi Nuclear Plant, before and after the 2011 earthquake (http://www.nytimes.com/interactive/2011/03/13/world/asia/satellite-photos-japan-before-and-after-tsunami.html).

as the data itself. Cox's duty as a designer, as she sees it, is to cultivate empathy and develop new ways of thinking with each new set of information that surfaces. This is also the duty of the individual moving through the model of humanized information design thinking: to generate new ways of thinking of thinking about data through its representation.

Renowned media critic and video game designer Ian Bogost has documented his sincere but failed efforts to incorporate videogames into storytelling and opinion pieces for the *New York Times*. The sentiment he employs is similar to Cox's: "Clearly a person cannot become an expert just by playing a game, but games can teach a mindset, a way of approaching problems through a set of rules, values, and experiences" (Bogost 108). Different games teach different mindsets; a design template for a game doesn't really work because different games have different agendas.

Information visualization designer Martin Wattenberg of IBM Research created the tool *NameVoyager* (Fig. 11) to encourage social use of data that might help expecting parents choose a name for their child. Popular names are laid out both alphabetically and chronologically. Each line stretches from 1880 to 2012, and is pliable in the sense that its level of thickness is in tune with its ranking in a given year. Blue lines are male names, and pink lines, female. One can choose to explore all names at once or separate

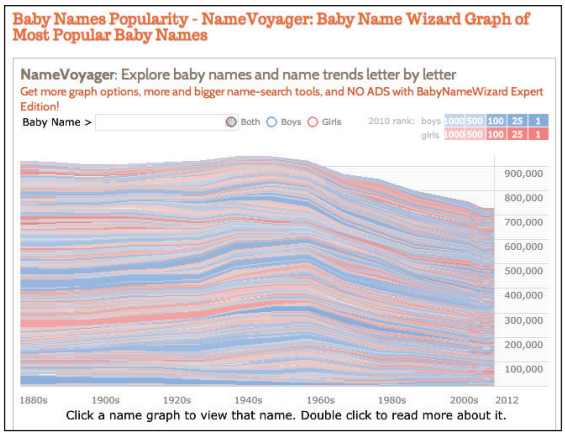


Figure 11. Screen shot of the interactive data visualization *NameVoyager* (http://www.babynamewizard.com/voyager#).

by gender. Such an idea, writes Bogost, "disrupts the traditional view of information visualization as a task-oriented, problem-solving activity" (Bogost 50). With this example, audiences are encouraged to be active participants in data exploration, rather than mere consumers. Exploration of data is encouraged on a non-expert scale, while at the same time, a principled information designer was required to gather, curate, and present the data in ways that make it meaningful to a specific audience. Users have the ability to create their own goals by exploring the data, discovering alternate spellings, perhaps, or exploring which names were popular a hundred years ago out of simple curiosity's sake.

Some datasets encourage problem-solving, some manipulation and playability, and all, exploration. The goal is primarily edification, and to take a step toward new ways of thinking and a willingness to experiment with new platforms that not only document but also create those new ways of thinking.

PART II:
INFORMATION DESIGN THEORY AND APPLICATION

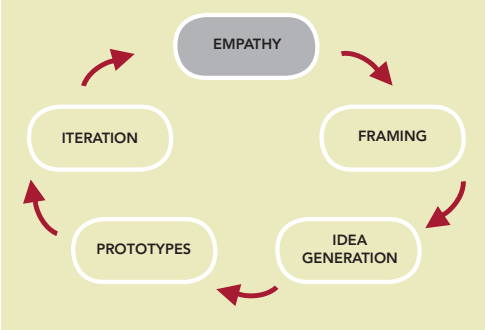


Figure 12. An illustration of Stanford's "begin anywhere" design thinking process (adapted from Berger (p. 273)). Design by Maggie Sattler.

CHAPTER 2: APPROACHES TO DESIGN THINKING

Design thinking is a human-centered problem-solving process. The process is used implicitly in traditional design fields such as architecture or graphic design. More recently, iterations of the process have been applied explicitly to non-traditional design fields to address problems in urban studies and the social sciences, among others. The *Chronicle* has most recently touched on this new marrying of the once-separate fields of the humanities and sciences: "The rationale is that contemporary urban problems like climate change and housing are too complicated for any one discipline" (Parry). Such is the foundation of design thinking; it exists as a productive means of tackling complex problems for which there is no single, simple answer.

Design thinking is a malleable process that has spawned many models of its application that apply specific steps to discovering solutions for complex problems. At the same time, the field supports an agile and continuously evolving process that can be altered as needed to reflect the situated uniqueness of the particular issue being explored. Stanford University's "begin anywhere" process embodies such agility quite effectively. The model involves five basic requirements as outlined in *CAD Monkeys, Dinosaur Babies and T-Shaped People*, with the insistence that one can begin anywhere and move in any order, though all steps are crucial to the project's outcome (also see: Fig. 12):

> 1) gaining expertise about a problem or subject area, primarily through empathy with the people directly involved; 2) framing the challenge you're going to tackle (which is to

> say, making sure you're asking and trying to answer the right questions); 3) generating options or ideas; 4) creating prototypes to test those options; and 5) iterating, or creating subsequent refined versions of your original prototype, based upon feedback. (Berger 272)

The humanized information design thinking model takes many cues from design thinking. Design thinking is a designer's process at heart. Its foundation is, it seems, best expressed not through analyses of abstract statements but through an example in the form of a project of the author's own undertaking: the multifaceted Resilient Communities Project.

CASE STUDY 1: NEIGHBORHOODS AND THE RESILIENT COMMUNITIES PROJECT

In the fall of 2012, I took a graduate course in design thinking in which I was assigned to work with the city of Minnetonka as its government was taking into consideration whether or not to establish official neighborhoods. At the time, a number of other graduate courses around the university were working on other engineering and sustainability focused issues with Minnetonka; the design thinking class was one of two teams assembled to address the neighborhoods question (the other team was part of the university's masters in public policy program). What follows here is a sketch of my design thinking approach to the question of whether the city ought to create official neighborhoods.

FRAMING

While my instinct was to dive into the information- and empathy-gathering step of the process, I began with framing the challenge (which, incidentally, also involved a lot of information gathering, but at the time was more about finding a context for the problem than about gaining empathy for the users). Why did Minnetonka want to do this? What was its context? Through conversations with my team's Minnetonka and University of Minnesota representatives, I discovered the project's intent was to actively inform the city's sustainability and future growth, as the city seeks to attract young families and professionals to live there. It also wanted to create better community cohesion and more effective communication patterns when it wanted residents' input on developments that would affect them. In addition to contextualizing the problem, I sought to contextualize the suburb, and immersed myself in Minnetonka city life, hanging out at its parks that residents held in such high regard and visiting stores, colloquially considered "neighborhoods," and the Ridgedale Library to get snapshots of daily life in Minnetonka.

EMPATHY

I was fortunate to have had the opportunity to speak face-to-face with residents at an open house at its City Hall, where I discovered, rather discouragingly, that residents were

primarily indifferent to the idea of neighborhood creation. They overwhelmingly couldn't comprehend the concept's practicality, and they were already satisfied with their existing levels of engagement with neighbors and with the city.

As my next step, I contacted the president of an existing and successful (by the city's definition) neighborhood association in Minnetonka that has a tremendous relationship with the city: the Sherwood Forest Association. I was surprised to discover what Patrick Nolan, president of the association, considered to be problems the association was facing, as they were emblematic of the same issues the city was facing. He had the sense that the association was approaching the need for a new, third wave of leadership in which younger members ought to assume more authority. He made it clear that his association has been successful because it has grown organically to meet the needs of residents as they have arisen. Had it been mandated, it wouldn't have become successful.

Nolan also showed me an item that caused me to apply a more futures-thinking approach and would become crucial to the direction of my project: A *Time* magazine article he had saved from 1981 that foresaw the dawn of an era in which people would be able to manage their own bank accounts from computers in their own homes. At the time, the article provided uncertainty in readers. It hit me that this was only 30-some years ago, and now it's an activity many people in developed societies wouldn't necessarily think twice about. It caused me to wonder how neighborhoods might evolve in 30 years, perhaps becoming some hybrid of online connection and geography, in ways that will seem obvious then but might feel rather extreme now.

GENERATING IDEAS, AND MORE FRAMING

I strongly felt the time was nigh to begin coming up with concrete ideas to address the question of neighborhoods. I also recognized that information gathering, rather than being a separate step, was going to be folded into each step along the way. I wanted to discover a precedent for the work I was doing, and research led me to the city of Seattle, a city that I found to have an unusually large volume of electronic neighborhood representation.

At the time, there were roughly 22 blogs that represented neighborhoods within the

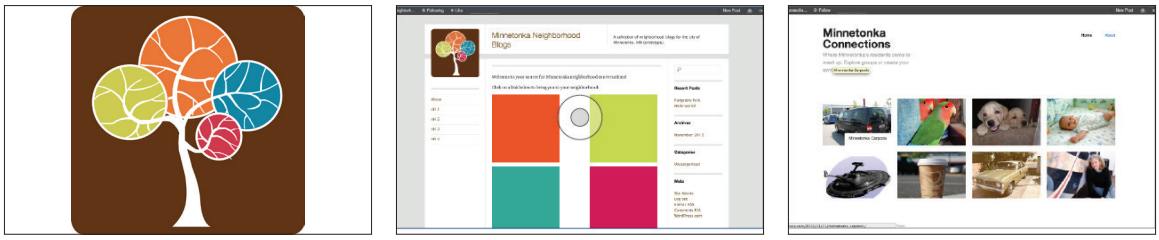
city limits of Seattle. I calculated this blog data and discovered that the average neighborhood blog and the size of the neighborhood it depicted could fit into Minnetonka four times. I began to work with this idea of a quadrant, noting that a highway already creates a natural split down the middle half of the city of Minnetonka, so a natural boundary already existed through which a quadrant could naturally be conceived. I also continued to play with the idea of neighborhood representation in the blogosphere and how that might affect the project in ways that would be appealing to its target demographic. Because so much of society's communication has migrated online, why are we talking so much about traditional geographic neighborhoods when the reality is that the average person is beginning to make and sustain connections virtually? Would we be open to talking about a sort of hybrid neighborhood of the future in which geography is only part of the equation?

PROTOTYPING

To test this research and illustrate my ideas, I created three prototypes: (1) a logo depicting four neighborhoods that also represented trees, which I discovered to be very important to locals (at its essence, what I did here could be considered information design); (2) a blog based around the idea of four connected yet distinct neighborhoods; and (3) an online network similar to the popular social networking site Meetup.com (Figs. 13–15). The third was the realization of a need I discovered through alternate research—that 700 Minnetonka residents are already members of Meetup.com. This prototype also grew out of a broader sense I had received from residents' input that those without children tend to feel more isolated and seek connection within their community.

ITERATING

I had had the prototypes in hand, but felt that the images alone meant nothing unless I could get a documentable sense from residents that either of these platforms was worth pursuing. Thus I created a survey that addressed what I wanted to know from residents: Did they like the idea of a blog? Or of a network connecting people via different needs or interests? I'd been directed to discover whether young families felt that their interests



Figures 13–15. From left: A logo developed to combine residents' regard for nature and my consideration of four neighborhoods; a neighborhood blog prototype; an online community connections website prototype.

were adequately represented in the city and whether they felt connected within their community. This survey covered all of these points. I distributed it liberally, but found I had trouble getting anyone to take this survey, despite outreach to people I had met—including a reporter at the localized news source Patch Minnetonka.

It wasn't until the semester was almost over that Patch Minnetonka decided to post it to its website, and then I ran into the fortunate problem that I was getting a bunch of great data though nearly too late to incorporate it into my recommendations. I did take away three observations from the data I accrued: (1) residents of all ages turn to their Minnetonka Patch website as a sort of city blog; (2) those residents have a diverse set of interests and needs; and (3) that capturing and meeting these needs online would be an idea worth pursuing.

SYNTHESIS

As the semester came to a close, I was required to synthesize and finalize my project. I wound up presenting three recommendations based on my research and experiences to the city of Minnetonka: The first and most obvious was to ask the city to consider the future of and potential effectiveness of new electronic platforms for encouraging residents of Minnetonka to connect with one another. I recognized that to recommend a blog from the outset was a bit bold, and at the same time, just the mere consideration of some new means of communication with residents online would mark a milestone in progress for the city in reaching its goals.

My second recommendation was to be open to divergent thinking, a behavior that is

meant to “multiply options to create choices”; its nemesis is convergent thinking, which is “a practical way of deciding among existing alternatives” (Brown 66-67). My understanding is that the city relies upon its annual survey to capture an in-depth picture of residents’ satisfaction. At the same time, I discovered that only 31 of 229 of the city of Minnetonka’s full- and part-time employees (or 13.5%) actually live in the city of Minnetonka. While I have been told that there are certain tokens of immersion already in place, such as involvement with city organizations, I could not help but wonder whether these numbers point our room for the risk of miscommunication and a need for further experiential understanding of Minnetonka residents’ daily lives. While addressing new challenges in traditional ways might be practical, it will also only ever lead to the best answer being pursued among existing alternatives, rather than a means of creating new possibilities by probing the future.

After presenting this observation to the city of Minnetonka, I was met with skepticism and discovered I’d put some city representatives on the defensive. Looking back, I would allow that this particular recommendation might have its shortcomings; it is likely that there are activities that encourage divergent thinking that are underway of which I am not aware.

My third recommendation was to think about, continue to mull, and even experiment with ideas about neighborhoods of the future, what they’ll look like, and how they’ll be defined. This was meant as an extension of the first recommendation; it functioned as a way to take a step back and look at the bigger picture. Will there be a need to identify geographic boundaries around official neighborhoods in ten or twenty years, considering that so much of communication across age demographics might continue to occur more and more online? What is the point of such boundaries and how would they connect rather than divide? The essential idea of the “neighborhood” and its current definition is going to evolve further when taking into consideration that I could still follow, and be a networked part of, my hometown community in North Dakota online while physically living a state away. New platforms that have already emerged thanks to new technologies are already changing the ways we think about making connections; what will this evolu-

PROGRESS ROADMAP (SEPT.—DEC. 2012)

EVENTS | IDEAS | RESEARCH | DOTTED LINE=ONGOING

Ongoing print, online research throughout. Key resources: *CAD Monkeys, Dinosaur Babies, and T-Shaped People* (Warren Berger), *Design Thinking* (Thomas Lockwood), *Change by Design* (Tim Brown), *The Atlantic* (http://www.theatlanticcities.com/neighborhoods/2012/01/awkward-art-neighborhood-naming/843/), Urban Institute (http://www.urban.org/publications/412057.html), Center for Creative Community Development at Williams College (http://web.williams.edu/Economics/ArtsEcon/Toolkit/frames/community.htm), 22+ neighborhood blogs based in Seattle, data from City of Minnetonka employees, residents, surveys; among others.

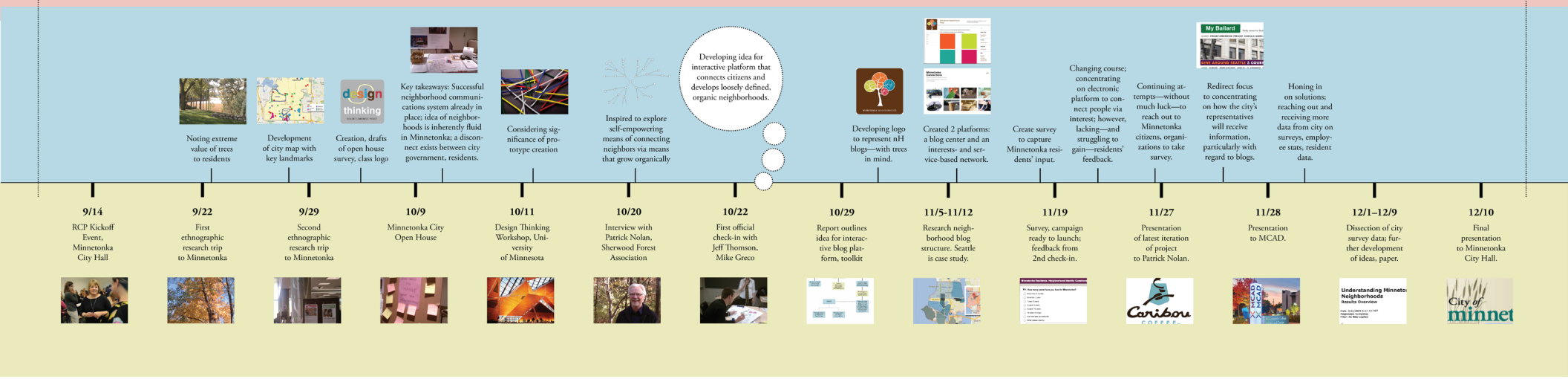


Figure 16. An annotated timeline of progress made for Minnetonka's Resilient Communities Project, created by Maggie Sattler.

tion in thought and technology look like a few decades down the road? And how can we design an ideal future right now?

One city representative who seemed particularly intrigued by my final statement spoke with me afterward. Does this mean creating apps for city parks? Helping to connect residents better to their surroundings and to each other through technology? My answer, of course, was yes.

REFLECTION

This had been my first non-traditional design project that explicitly utilized the design thinking process. The process itself is crucial to the development of the model of humanized information design thinking. At the same time, several elements of the project stood out to me that had gone beyond the five "begin anywhere" steps:

The utility of information design. Despite that the project wasn't expressly concerned with information design, I had wound up designing a graphic that depicted my work and progress throughout the semester (Fig. 16). Not only was this graphic useful in presenting my work to the city, but the process of its creation helped me to generate new ideas about how I would move forward. To generate ideas and plans was one thing; to document these was another, more useful, way to visualize progress. It allowed me to develop solutions that were all-encompassing rather than ones that slowly built upon each subsequent step.

Collaboration. To document progress and be able to demonstrate to the city why I took particular steps forward helped my collaborators to understand my work and better guide future steps to ensure they would align with their expectations. I had checked in with stakeholders throughout the process, and although this was an activity my design thinking model did not prescribe, it was nonetheless important in order to refine and meet my stakeholders' specific goals.

Boundary knowledge. In the process of creating recommendations for the city of Minnetonka, I made sure that no detail I had gathered was disregarded. Residents were really into their trees, I heard over and over again. This in itself did not help me to make

recommendations, but it did factor into my final results in the form of the logo I had created. The importance of boundary knowledge, while not necessarily always significant in design thinking processes, was certainly significant to my information design thinking process in this situation.

Synthesis. It's also notable to me that I had subconsciously added another full step—synthesis—to the "begin anywhere" process. My project had had a specific deadline, at which point I had no other option than to complete the project despite that I felt I could have extended my work on it. At some point, I had to put everything together and effectively communicate solutions in some form to stakeholders.

Distribution of time. In the end, my commitment to assessing the real needs of the users (in this case, that meant differentiating between Minnetonka's residents and its city leaders) meant that I spent the majority of my time on the empathy-gaining step, making sure I was obtaining a complete enough sample of differing opinions to be able to make thoroughly informed recommendations to the city of Minnetonka. This focus on the user felt crucial to the project, and is very significant in the field of design thinking. Still, I hadn't felt prepared for how much time would be involved in relating to the user. I believed that a model that would account for such distribution of time ought to go beyond the needs of the user to also serve the needs of the designer.

LIMITATIONS OF DESIGN THINKING MODELS

Various models exist to illustrate design thinking's basic elements. According to *Fast Company* magazine (2006), models of design thinking are based upon four key elements: Defining the problem; creating options for problem solving; refining selected directions; and executing the best option. Also indicated here is a sort of procedural Step 3.5 in which previous steps are repeated as new knowledge surfaces. The website *Design Thinking for Educators* (n.d.) lays out five steps: discovery, interpretation, ideation, experimentation, and evolution. And finally, to use an example outside of academia, the company EDIT Innovation, which offers design-thinking services and teaches design-thinking workshops, determines four steps of design thinking: empathizing, defining, ideating, and testing. Most popular applications of design thinking involve the same basic key steps in some form.

These basic steps are fundamentally similar to those in Stanford's five-step "begin anywhere" approach. Yet this process is not without its limitations. The model's having been presented in ordered steps with the instruction that users may begin at any particular stage is counterintuitive, suggesting that even if one begins anywhere, there is a specific path to follow in the problem-solving process. Additionally, the prototyping stage appears at the fourth and fifth steps, suggesting by design that the initial three stages of information gathering, framing, and idea generation are going to require the bulk of time spent.

Unfortunately for the Minnetonka Resilient Communities Project, it was not until the prototyping stage had been initiated that gaps in the information had been found. This discovery had been made as the project's deadline was near and time to continue to experiment was scarce. Fig. 17 depicts the "begin anywhere" model as adapted from Berger (273) (the gray tab indicating a perceived first step despite the "begin *anywhere*" title), and a more accurate representation of the author's experience and movements through the process on the right. The lefthand model is uniform and neat. The righthand model is a semi-humanized interpretation of lived experience with the same model.

As illustrated in these models, the imagined end of a project's life is not involved in any of the "begin anywhere" model's five steps. If we begin anywhere, could we also

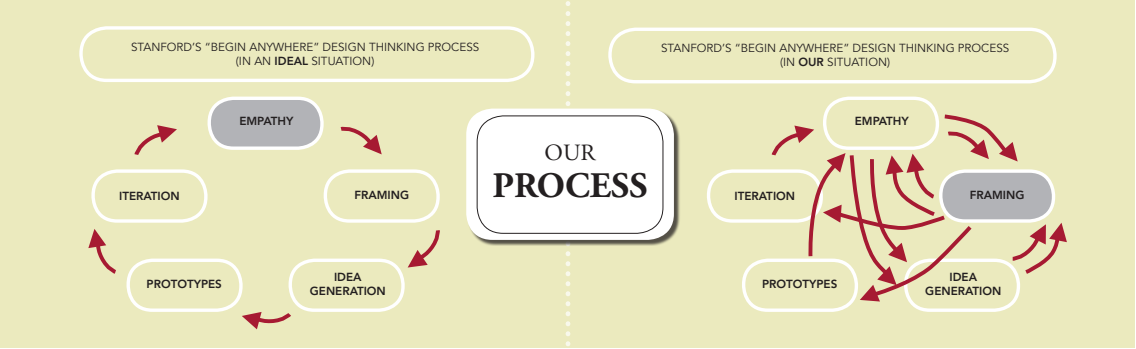


Figure 17. An illustration of Stanford's "begin anywhere" design thinking process in an ideal situation (left, adapted from Berger (p. 273)) and the author's perception of her movement through the Minnetonka Resilient Communities Project (right). Illustration by Maggie Sattler.

"end anywhere" in the sense that we will abandon a project at one of the steps? The final ordered step in the process is to reiterate and continue to experiment. This is not feasible for most projects, which will require a deliverable of some sort. *Begin anywhere*, perhaps, but *end at a specific destination*.

It also remained bothersome that the carry-through of the final recommendations remained a question mark. If the recommended actions and behaviors had been adopted, how would the designer find out, since the project had reached its conclusion at that point? If the city didn't adopt such behaviors, would the recommendations in the end be considered unnecessary? How would one begin to gauge the outcome's relative success or failure?

Let us consider an alternate model of design thinking that is slightly different from common American models and directly addresses a project's final steps. The Australian Centre for Social Innovation (TACSI) is a three-year-old organization that prides itself on having built an interdisciplinary team to tackle social problems for and with families across Australia—including chronic disease, an aging population, family breakdown, and social inequality experienced by its indigenous communities. It has built a process it calls "Radical Redesign" (Fig. 18), which is geared toward addressing such problems effectively and efficiently.

TACSI's process involves seven steps: (1) *Get Ready*, in which the right team for the

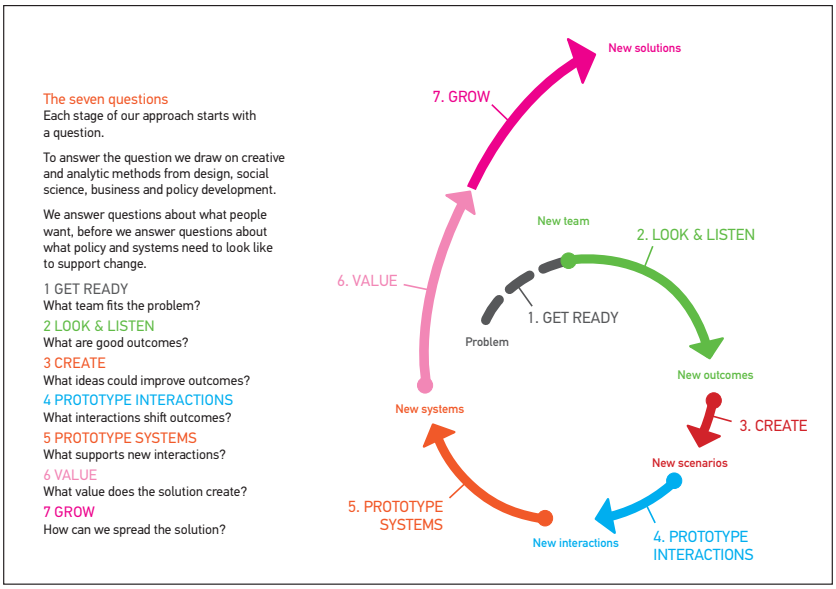


Figure 18. The seven steps of the TACSI's Radical Redesign approach to problem-solving. (Screenshot; http://www.tacsi.org.au/assets/Documents/Publications/Family-Project/rrssfbyfsmall2.pdf)

problem is chosen; (2) *Look & Listen*, where time is spent becoming immersed in the places and with stakeholders in order to understand the needs of all parties and with the goal of reframing the problem in order to achieve the outcomes most if not all stakeholders desire; (3) *Create*, in which problem-solving ideas are brainstormed, developed, and visualized; (4) *Prototype Interactions*, in which ideas are sketched out on paper, tested and contextualized, then enacted on a small scale to quickly discover what works and what doesn't; (5) *Prototype Systems*, which involves seeking out systems that will enable new interactions, with the goal of influencing policy and creating optimum outcomes; (6) *Value*, projecting a value onto the new solution; and (7) *Grow*, in which ideas to spread the solution are generated. It is a far more complete process, though flexible enough to accommodate many different types of projects.

Like the "begin anywhere" process, this one too is circular in its design but in fact does not close the circle. Time does not move in a circular fashion as one moves through a project's steps; it is always moving forward. This concept is significant to an information design thinking model that concerns itself with the designer's experience. It is also

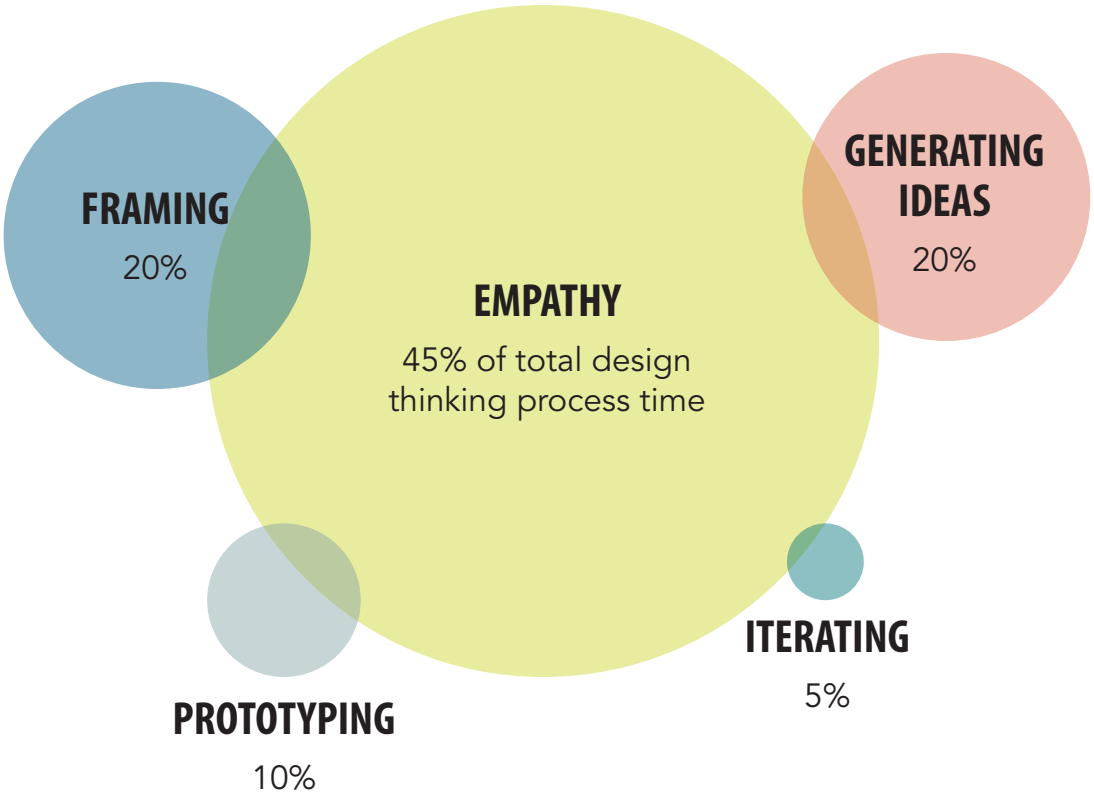


Figure 19. Taking Stanford's "begin anywhere" design thinking steps and scaling according to percentage of time spent on each one for the Minnetonka Resilient Communities Project. Design by Maggie Sattler.

useful for the presentation of a project's end point and potential extension, as the "Radical Redesign" process emphatically implies a forward movement rather than closing a complete circle.

In such a methodology in which steps are identified, it's worth exploring whether the existence of such steps hinders progress. In 2011, Bruce Nussbaum, then a well-known advocate of design thinking, elected to stray from such methodology almost entirely. He wrote in *Fast Company* magazine that the success rate for design-thinking processes is low, that the inherent goal of design thinking is to promote creativity, and when creativity is broken down into a "linear, gated, by-the-book methodology," it counterintuitively hinders genuine creativity, emergent thinking, and innovative solutions. However, it could be argued that without a process of steps, important reasoning elements in a problem-solving process could be missed. The "begin anywhere" approach, of course, does not advocate

a strict adherence to such steps, though Nussbaum is right to convey that those without experience in design thinking are likely to treat a process of linear steps as a single catch-all project rather than a *process*.

At the outset, a linear process makes sense because humans tend to understand lived time in a linear fashion (consider, for example, the timeline display in Fig. 6). Let us analyze what's behind the Resilient Communities Project's Progress Roadmap (Fig. 16). The amount of linear time spent suggested by the "begin anywhere" visual (Fig. 17) suggests that all steps are equal. The amount of perceived time actually spent between all five steps (Fig. 19) differs significantly from the visual of the model that inspired it. Fig. 19 demonstrates the author's desire to have had more time with the prototyping and iteration stages. "Begin anywhere" is designed so that there is no one straight path forward and is flexible enough to apply to a diverse scope of projects; its limitations are in its lack of guidance with regard to time spent on each step and its lack of a finalizing step. The TACSI approach is strong because of its treatment of time and in that it does include finalizing steps; at the same time it is limited in that it does not take into account that those who apply the approach might need to move in a non-linear fashion, revisiting previous steps as new information is discovered.

Time is a crucial element to understanding the process of design thinking—whether applied to information design or any other design or non-design project. As the formats through which we document and represent and express space and time evolve, how too shall our processes themselves also evolve? This question is often taken up in the field of the digital humanities, and the next chapter shall draw connections between the fields of design thinking and digital humanities to interpret how this question of time and its representation might be best explored.

CHAPTER 3: DIGITAL HUMANITIES

We know design thinking provides a methodology for creating emergent-thinking solutions to problems not traditionally found in design fields. The field of digital humanities is also rooted in a methodology that supports the creation of new ideas, tools, and ways of thinking. Digital humanities has emerged in response to an increasingly digitized society with the intention of creating new tools that assist a humanist in wading through a multitude of raw information that is now in electronic, searchable form. This is an interdisciplinary field that comprises humanities scholars from very different backgrounds, including English, anthropology, computer sciences, and media studies.

The fields of digital humanities and design thinking have similar histories. According to Thomas Lockwood, author of *Design Thinking*, his field initially emerged during the Industrial Revolution when labor was beginning to become automated and an opposing movement against standardization came out along with it. Design thinking is meant to bring focus back to the user and the user's very human needs in an age of overabundance. Almost 200,000 products are injected into the U.S. market each year, many created without a purpose (Berger 7). Design thinking not only brings renewed fervor to creating objects with purpose, it also has become popularly applied to creating meaningful business and social solutions.

Digital humanities had a much later genesis in the mid-1990s with the establishment of the William Blake Archive, an initiative to digitize and make publicly available the prints, paintings, and poems of William Blake[5]. Where design thinking has become widely applied to bringing order and meaning in instances of overabundance, digital humanities too aims to harness the opportunities that new technologies offer with the goal of assigning some senses of order and meaning in an age of digital abundance. It became officially recognized in 2006 when the National Endowment for the Humanities launched the Digital Humanities Initiative (Kirschenbaum); it reached a fever pitch when it was hailed the "next big thing" in the *Chronicle* after the 2009 Modern Language Association convention (Pannapacker). Digital humanities centers have now been established at insti-

5 http://www.blakearchive.org/blake/

tutions around the world (including Columbia, UCLA, the University of Nebraska–Lincoln, the University of Virginia, and Stanford), and a healthy amount of grants have been funneled toward development of the field (Orwant). Johanna Drucker writes that digital humanities is "the study of ways of thinking differently about how we know what we know and how the interpretative task of the humanist is redefined in these *changed conditions*" (*SpecLab* xii; emphasis by author)—as in, new electronic environments. The field, much like design thinking, is a source of much debate and intrigue, and it has prompted many questions that continue to be debated among its scholars (see: Fig. 20).

In her book *SpecLab*, Drucker identifies four steps that are "the means by which intellectual work takes shape": iterative conceptualization; visualization; production; rework (31). These actions are fundamentally similar to design thinking's actions of prototyping and reiteration; the actions of information gathering, framing, and generating ideas are implied though not explicitly mentioned. Where design thinking concerns itself with the *user's needs*, digital humanities concerns itself with *humanistic principles*, and both have the same ultimate goals. Humanistic principles consist of the situational contexts that make us human. A user's needs are also concerned with these principles; such needs are, in effect, what makes the user human.

Journalist Simon Rogers of *The Guardian* notes a growing public interest in seeing data visualized in order to make it easier to understand. This trend has sprung from the instance of complex sets of data having been made public on the Internet, and has contributed to a veritable game-changer for data journalism: "The world has changed and it is data [and presumably by extension, the Internet] that has changed it" (Rendgen 62). In the same sense, the field of digital humanities has also mobilized as the result of the Internet and the availability of data that the Internet makes possible. Writes Tom Scheinfeldt in his essay "Sunset for Ideology, Sunrise for Methodology?":

> The new technology of the Internet has shifted the work of a rapidly growing number of scholars away from thinking big thoughts to forging new tools, methods, materials, techniques, and modes of work that will enable us to harness the still unwieldy, but obviously game-changing, information technologies now sitting on our desktops and in our pockets. (Scheinfeldt)

Figure 20. Created by Maggie Sattler for University of Minnesota Press, 2011.

While the field isn't only about building things, it's notable that a natural extension of digital humanities theory is the creation of new means of thought and even new objects. It is a field that relies upon both theory and practice. Literary scholar N. Katherine Hayles of Duke University writes that without theory, practice might be reduced to technical skills, and at the same time, without practice, theory is "deprived of the hands-on experience to guide it and develop robust intuitions about the implications of digital technologies" (Hayles 15). Take, for example, the Serendip-o-matic, a tool that was created by a digital humanities team within one week. This is a tool with which one can copy/paste any amount of text one has written, click a button, and then allow the program to comb the web for material from libraries, museums, and archives around the world. It displays images from new sources based on key words from the text entered that are meant to be "suggestive, pointing you to materials you might not have discovered."[6] Essentially it is a new reference tool with the goal of inspiring new ideas through new ways of thinking.

The Serendip-o-matic is but one example of a digital humanities tool. It exemplifies digital humanities *theory*—in that the digitization of knowledge must be harnessed in ways that inspire innovative work among its scholars—and puts its ideas into *practice*. Hayles would refer to this as an "ethic of making" (12), and cites more examples from a particular media course in which students produced were directed to produce projects, rather than essays, that included:

> elaborate digital ink mark-ups of medieval manuscripts, animated video mash-ups of diverse textual media, and a QR-barcode-based locative narrative that sent the professors scrambling around the building and its surrounding courtyard to read an essay that analyzed literary space by mapping it onto specific places in the archive. (Hayles 16)

In this sense, digital humanities theory becomes manifested in a methodology that promotes the creation of forms and platforms that represent knowledge in new ways.

Such combination of theory and practice inherent in digital humanities is also significant in design thinking. Without *practice*, design-thinking *theory* would cease to be relevant. Design thinking's concepts of framing, knowledge-gathering, and iteration are

6 http://serendipomatic.org/about/

all based on the assumption that a user has a problem to solve that requires a specific solution or set of solutions. Its motivation is the creation of new approaches, products, and even tools. Its agility-focused processes could be applied in theory, but a lack of practice would inevitably contribute to a lack of problem-solving success. One of design thinking's notable limitations has been that there are no means for measuring the success of a design-thinking outcome; has the solution been accepted, tested, even adopted? At the same time, if a design-thinking effort has ended in the creation of a solution, a set of solutions, or a recommendation for implementing solutions, it has fulfilled its new-idea-generating mission. One could also ask how we might measure the success of the Serendip-o-matic. Are people using it? It's hard to say.

Naturally, just because we can use new tools doesn't necessarily mean we should use new tools. Do they unearth meaning for the user? In his essay in the volume *Debates in the Digital Humanities* (Gold) scholar Gary Hall references a project that involves digitally mining text from books that had been digitized by Google that were published in the Victorian Age. Who cares, he writes, that the appearance of the word "revolution" spiked around the time of the French revolution and other revolutions around 1848? What does that tell us? And more importantly, what meaning does that have for the user? In turn, Hall notes a growing sense that such projects should not encounter criticism yet "lest they have the effect of strangling at birth what could turn out to be a very different form of humanities research before it has had a chance to properly develop and take shape." He is critical about this stance, questioning whether it's a cop-out for subpar scholarship or whether it really is a responsible futures-minded approach to creation.

A similar attitude comes to bear in design-thinking activity. A forum on the sustainability of higher education that the author attended recently gathered politicians, secondary education and higher education leaders, public policy officials, business leaders, and scholars. As part of an idea-generating activity the audience was asked to perform a series of ice-breaking collaborative activities as preparation for a 20-minute process of continuous idea generation. Teams were asked to draw new ideas without self-criticism or judgment. The underlying philosophy was that the more ideas that were generated,

the greater the likelihood that at least one idea would have some merit in responding to the challenges that the state of higher education faces. The ultimate goal was to develop a solution that had been the product of emergent thinking—a crucial element of design thinking. Did any teams come up with ideas of merit? That was as yet unclear, though the opportunity to continue the project does exists for months after the initial session. Still, it was worth questioning whether any useful solutions were achieved in the same vein of criticism as Hall applies to new digital humanities tools.

Emergent thinking is also inherent in the digital humanities. Scholar Stephen Ramsay notes that digital humanities scholars often contemplate the cultural, historical, and other implications in the reading of a given map. But the experience of *making* a map, he says, is quite different. It is a process of creation that "yields insights that are difficult to acquire otherwise." In fact, he writes, the field's emphasis upon the act of building represents a crucial but radical move in academia that takes digital humanities beyond the act of applying humanistic inquiry to digital technologies (a means of treating new disciplines with the same old approaches) and toward the creation of new tools based on emergent thinking that inevitably introduce new ways of representing knowledge.

DRUCKER AND THE REHUMANIZATION OF INFORMATION DESIGN

To build the proposed humanized information design thinking model, we first need to examine what makes information human. Humanistic inquiry can be defined as an exploration of elements that are inherent in human experience, including, for example, our perceptions of the experience of time (not just measured time—but time spent in the state of being anxious, or mindful, or hurried, or any variable of thoughts and emotions). Humanistic inquiry is also about the cultural and historic contexts that diversify the range of lived experience—and of course these are not the same for everyone.

Information designs based on humanistic principles must encourage the presentation of predictions and uncertainty, in contrast to scientific principles, which aim toward a consensus or repeatable results, says Johanna Drucker ("Humanistic Approaches to the Graphical Expression"). In Part I, we looked at examples of information design, which has been touted in digital humanities circles as a creative format that ought to not only be treated as a *product* of the process of humanistic inquiry, but also as a springboard from which new ways of communicating information can emerge. Popular examples of information design might serve particular purposes successfully, but many do not advance humanistic inquiry—and these are types of information design with which Drucker takes issue. For example, John Snow's cholera map (Fig. 2) displays a set of standard metrics

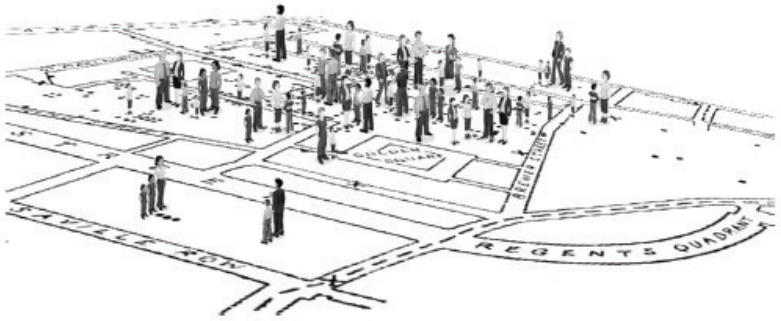


Figure 21. An alteration of John Snow's cholera map (see: Figure 2 for the original). Credit: Xarene Eskandar. Source: http://digitalhumanities.org/dhq/vol/5/1/000091/000091.html, Figure 17.

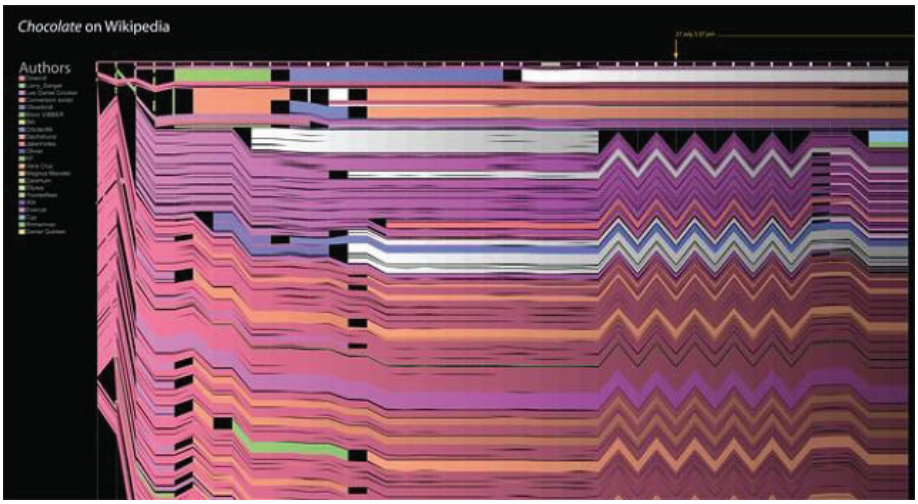


Figure 22. Martin Wattenberg and Fernanda Viegas, *History Flow*, 2003. Source: http://tinyurl.com/q273uww.

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that reduce the representation of an individual to a standardized black dot. This activity was, Drucker writes, "sufficient to that purpose [of leading the designer to discover where the disease had originated], adequate, but we could revisit that map and use it to express other factors. . . . In short, each dot represents a life, and none of these are identical" (Drucker, "Humanities Approaches," 52). She begins to reimagine Snow's map in its humanized version (Fig. 21), in which dots are no longer dots but images of people, gendered and with or without children.

Common examples of information design tend to reduce data's humanistic origins to standardized icons. Designer Peter Hall puts it most eloquently: "It is difficult not to see the reductivism in many of the visualizations rendering human communication as a thousand dots and veins of wispy color on black backgrounds, as if messy life had finally been conquered, sorted and re-arrayed as exquisite form" (Blauvelt 175). *NameVoyager* would be a good example of this; so would Fig. 22, *History Flow*, a graphic that visualizes uses of the word "chocolate" on Wikipedia. While *History Flow* is aesthetically pleasing and about an enticing topic, what is one to make about its squiggly lines, which are ostensibly meant to depict the collaborative nature of the site Wikipedia.org?

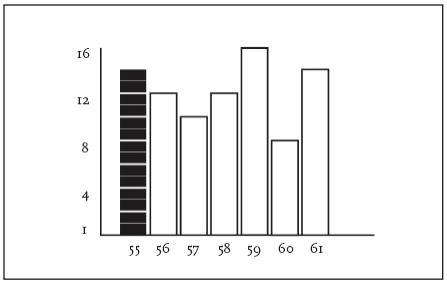
Drucker, too, writes that such examples are "positivistic, strictly quantitative, mech-

anistic, reductive and literal" and designed on assumptions such that "objects of knowledge can be understood as self-identical, self-evident, ahistorical, and autonomous" (Drucker, "Humanistic Theory"). In fact: "The principles of humanistic method are simple, after all: interpretation always produces a work as a reading; no work, image, text, is self-identical, it is always produced anew" (Drucker, "Representation"). Drucker's ultimate concern is that such designs that profess ultimate certainty might be taken as a representation of *what is* rather than as a springboard to further critical thought and inquiry about the nature of representation. She refers abstractly to tools that encourage automated thought (examples of which include Tableau and IBM's Many Eyes), comprehending that such automation is dependent on *ahumanistic* principles. Interpretation is not mechanistic but situated; every encounter with an object is different based on any variable states experienced by the user.

Such emphasis on the humanness of the end user is crucial to connecting the digital humanities to information design to design thinking. Without a focus on humanistic principles and the end user, there would be no foundation for design thinking. Similarly, the application of information design, when done correctly, places emphasis on the end user in a manner that directly informs the mode through which information is designed.

What, then, would a methodology of visualization look like that embodies humanistic principles? Drucker answers this question eloquently in a 2010 presentation, "Humanistic Approaches to the Graphical Expression of Interpretation," in which she advocates for a "rehumanization of digital activities," in essence what she calls an epidemiological shift from *data* to *capta*. Where *data* (literally "what is given") is fixed, scientific, self-evident, and authoritative, *capta* (literally "what is taken") is perhaps humanistic data, or data inflected with affect. According to Drucker, the latter is a means through which all quantification or parameterization puts the focus on human experience, or on a "co-dependent relationship of emergent phenomena." Where every reading of a text different in that meaning is not fixed for every user, so capta is meant to capture that experience. It has *no illusion of certainty*.

To bring specificity to her words, Drucker unveils two examples. The first (Fig. 23) is



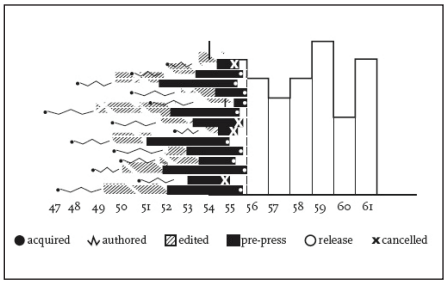


Figure 23 (from left). A simple bar graph. **Figure 24.** A more complete way to tell the story of Fig. 23. Graphic credits to Xárene Eskandar. Source: http://tinyurl.com/5t23tjw, Figures 3 and 4.

a self-evident bar chart graph that depicts the number of books published by a particular publisher between 1855 and 1861. The second (Fig. 24) takes into account that a book's life does not begin and end within the frame of one year; that a book acquired by a publisher one year might be years or even a decade away from publication when one takes into account the processes of acquisitions, editing, design, and production that must be accounted for if we are to actualize the complexity of the book publishing cycle. She ends the presentation on this note:

> If we re-center humanistic experience at the center of an interpretive model, we do something important culturally as well as intellectually, which is to claim that statistical, quantitative, qualitative information and their representation are only significant **within a human framework**. (Drucker, "Humanistic Approaches") (Emphasis added by author.)

Here Drucker criticizes the presentation of data as though it is a finite truth; in fact, she argues, there is no such thing as the common conception of *data*. It is all *capta*. All data originates from human observation and measurement that has a margin for error. All data is thus *not* self-evident or objective, no matter how its presentation might make it seem.

How might one apply these principles to information design projects? The answer is not a simple one. The following case study represents this author's exploration of that question.

CASE STUDY 2: INFORMATION DESIGN AND ENERGY USE

Every day we live with the knowledge that we could be doing some things differently. For every activity in which we participate that consumes energy provided by nonrenewable resources, it seems there might be an environmentally friendly alternative. For every to-go cup of coffee we purchase, we could bring a reusable mug. When we buy certain food staples, we could be buying them in bulk and bringing reusable containers to transport them. We could bring cloth bags to the grocery store. Unplug electronic devices when not in use. Get a smaller refrigerator. Eliminate meat from our diets. Invest in solar energy. Ditch motorized transportation. Wash clothing in a bin or bathtub. Make our own soap. Even take a one-gallon shower.

We could do all of these things. And yet—do we?

For some of us, the answer is yes. I do not mean to imply that no one takes any of these energy-preserving measures (and I understand that with the use of the word "we" I am taking extreme liberties with conventionalization). But no matter how much effort we put into resource preservation, we live with the knowledge that we could be doing more to reduce our dependence on the use of non-renewable fossil fuels. Eliminate, eliminate, eliminate.

We also live with the implicit understanding that our preindustrial ancestors lived out their days without using nearly so much energy. We understand that fossil fuel resources are nonrenewable. Yet we do not always understand the ways in which we deplete these resources on a daily basis. As architectural designer Molly Eagen writes in her 2011 thesis for her Master of Science in Sustainable Design, "We are disconnected from the process (and difficulties) of most of the systems that support our everyday lives" (6). This disconnect exists because it can. If we do nothing to curb our energy use, nothing cataclysmic happens as an immediate result.

On September 27, 2013, a United Nations climate panel for the first time declared that it would pose a global upper limit on greenhouse gas emissions. According to the *New*

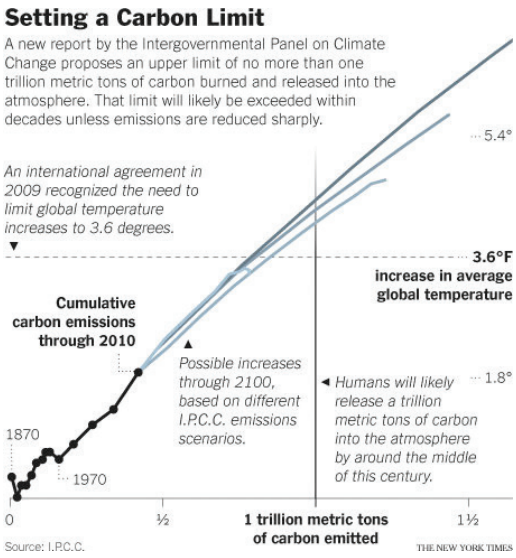


Figure 25. Map of cumulative carbon emissions and projections of future emissions and the corresponding projected global temperature increase. Source: http://www.nytimes.com/2013/09/28/science/global-climate-change-report.html?pagewanted=all&_r=0

York Times assessment[7] of the panel's conclusions, if the panel's target is to stay within 3.6 degrees Fahrenheit above the level of the preindustrial era, no more than one trillion tons of carbon can be burned—ever. At the rate we're going (Fig. 25), projections put us well above the 3.6-degree limit within the next two hundred years.

The situation presents a strong motivator for severe change. Our global governing forces have elected to quantify a carbon-emissions ceiling to which the world's citizens and industries will be required submit. The number "1 trillion metric tons" considered without context is arbitrary. What does it tell us about our collective actions with regard to our past and our imagined future? How will our daily routines be modified?

REGIONAL DATA CAPTURE

Through a series of meetings in the summer of 2013 I was introduced to an ambitious undertaking to connect environmentally sustainable thinking with performance metrics:

7 See: http://www.nytimes.com/2013/09/28/science/global-climate-change-report.html?pagewanted=all&_r=1&

the Regional Indicators Initiative (RII). A team assembled by the Minnesota architecture firm LHB, Inc., elected to gather four years of resource-consumption metrics from twenty participating Minnesota cities. LHB, Inc., is responsible for the online publication[8] of multitudes of data sets. By visiting its RII website and clicking "Explore the Data,"[9] one is taken to a screen in which a large bar graph is displayed that is interactive in the sense that one can click on different categories of metrics by *sector* (residential or commercial), *geography* (select one or all of the 20 cities involved), *time* (choosing among the four years between 2008–2011) or *other secondary factors*. This setup exists for all areas of data collected and then some: energy, water, travel, waste, greenhouse gas emissions, and costs (to the consumer).

The website's aim is to make this information available to city leaders, businesses, and individuals. As an individual, I am quite interested in the data's implications, though I do get lost in it without a context with which to compare it. At the time I found myself looking for specific goals for carbon emissions on an individual level. So I set out to create them.

Getting to know the data

I had been introduced to the RII by Falcon Heights' mayor, Peter Lindstrom, and city administrator, Bart Fischer, and set out to use their city's energy use metrics as the focus of my data exploration. I was given a report of many sets of data to analyze, and in due course I discovered that to analyze such metrics of energy use was one thing; to learn what they're made of, another. To wholeheartedly understand what the metrics are and what I wanted to do with them was another stage entirely.

Through various e-mails, reports, and meetings I learned that the energy metrics were comprised of commercial/industrial sector measurements of consumption and of residential measurements of consumption that had been grouped together. My goal was to undertake a humanistic exploration of the data, and as such I chose to focus on piecing

8 http://regionalindicatorsmn.uli.org/.

9 http://regionalindicatorsmn.uli.org/energy-chart

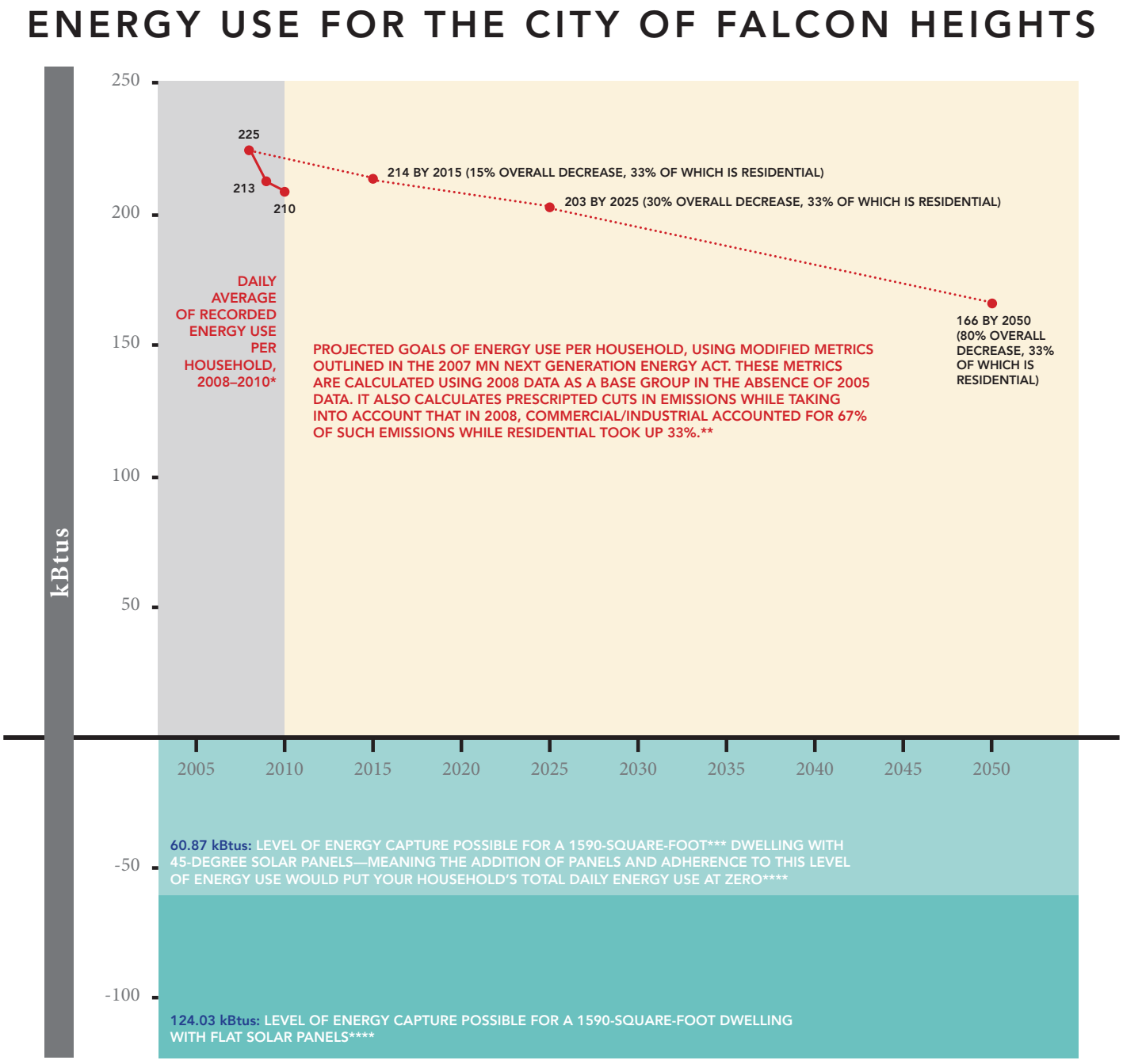
out the residential, or household, metrics of energy use. I charted out numbers from the report and normalized them in order to compare these with Minnesota's energy goals[10] as outlined by the 2007 MN Next Generation Energy Act. This was a start. But it lacked the essential elements of humanistic inquiry.

Within this period of exploration I had also been introduced to a thesis project by University of Minnesota graduate Molly Eagen. Her thesis was based on an undertaking in which she attempted to live for a period of 100 days between August and November 2010 without the use of oil—which she recognized as ever-present in most humans' daily activities. Her goal was to understand, through lived experience, the extent to which contemporary society relies on oil. Eagen and her project, for me, gave a face to the RII's statistics and contributed a record of what is within the humanistic realm of possibility with regard to living as sustainability-minded a lifestyle as possible. One of the first steps Eagen took was to calculate how much the installation of solar-energy panels onto her rooftop would afford her in terms of energy savings, setting her with a daily electricity budget of 6.82 kWh (kilowatt hours). Using the formula she devised[11], I applied her calculations to the chart I created (Fig. 26) to show where the average Falcon Heights household's measurements of consumption were at, where the state wants them, and what Eagen's project tells us is possible. It was a mission to communicate the need not only to curb energy use, but also to harness solar energy to help curb household emissions.

I had had something concrete but I still wasn't satisfied. One option I entertained was to visualize an entire day of energy use that would provide accessible calculations with the ability to be adapted for any individual. In theory, it could work. But in order to be useful in practice, it would need to assign numeric averages to such activities of energy use as heating, cooling, washing clothes, food preparation, food preservation using a

10 http://www.house.leg.state.mn.us/hinfo/newlawsart2007-0.asp?storyid=608

11 Formulas for solar-energy savings calculation can be found at: http://100dayswithoutoil.blogspot.com/2010/08/day-6solar-power.html. Eagen has expressed to me that this calculation should be accompanied with a disclaimer. Though the calculation was informed by research and persons with expertise in the matter, with so many factors at play (efficiency of solar panels, angle of panels, cloud cover, snow cover, etc.), the numbers were difficult to nail down. Still, this is the smartest single calculation I have come by. It serves to strengthen the point that what we are dealing with is not data ("given") but capta—"taken" activity. Within this distinction, writes Drucker in DHQ, "a world of differences arises."



* Data from the Regional Indicators Initiative website. Source: http://regionalindicatorsmn.uli.org/energy-chart.
** Metrics calculated according to goals set forth in the 2007 MN Next Generation Energy Act with regard to cutting the state's greenhouse gas emissions sharply by 2050. Source: http://www.house.leg.state.mn.us/hinfo/newlawsart2007-0.asp?storyid=608. Note: These goals do not account for projected population growth, which would affect per-household energy use projections in meeting the state's goals. For more information about these projections, visit http://regionalindicatorsmn.uli.org/about-regional-indicators-initiative#purpose.
*** 1590 square feet is an average based on R-1 dwelling data from 2007 provided by the city of Falcon Heights.
**** Calculated with equations provided by Molly Eagen as part of the 2010 "100 Days Without Oil" project. Source: http://www.100dayswithoutoil.blogspot.com/2010/08/day-6solar-power.html.

Figure 26. Chart of energy use taking into account recorded data, projected goals, and energy capture possible using solar power for the city of Falcon Heights. Design by Maggie Sattler.

refrigerator made before 2001 versus one made after 2001, lighting, TV and video game use, etc.—and take into account that every different equipment model used for said activity would use different amounts of energy. I deemed that such an output of information design would likely lead to more frustrations than edification on the part of the user.

I pursued a type of information design that experimented with encapsulating the diversity of human experience. I wanted to appeal to apartment-dwellers and house-dwellers alike; households of varying sizes, with or without children; and households in metro and rural areas, with different means of access to different things. Precedents along these lines were difficult to acquire.

Eagen's project provided a sense of what a humanistically possible reduced-emissions lifestyle would look like for a single house-dweller with roommates—but also on an extreme scale that was not sustainable on all accounts (for example, she resumed taking hot showers once the project was complete). Author Colin Beavan of *No Impact Man* fame (the book and the film) elected to do something similar to Eagen, though he preferred eliminating resource-consuming activities on a graduated scale rather than dropping all consumption cold-turkey (as Eagen did). Beavan writes from the perspective of an apartment-dweller in New York City with a wife and child who begins his project by taking a reusable mason jar with him to Starbucks (rather than creating paper-cup waste) and brings the project to its peak when he shuts off all electricity in his apartment—no lights after dark (though he does have an office to retreat to when he needs computer access). In terms of humanistic inquiry I was beginning to be on to something—here were two sources, a single female in her mid-twenties and a family man in his mid-thirties—as a basis; both camps had come up with the same conclusions in terms of considering their lives having been made better by their experiences, though they admit that once their projects were past, only some environmentally mindful habits remained.

Not surprisingly, Eagen makes it clear that the oil-absent lifestyle she embarked upon was much easier to do in warm weather than in Minnesota's cold climate. Having begun the experiment in August, she enjoyed a plethora of local co-op and farmers market offerings (refusing to consume anything that traveled more than 300 miles), happily trans-

ported herself only by bicycle or by walking, rose early in the morning with the daylight, and enjoyed water that was captured in a rainwater barrel and heated with solar energy throughout the day[12]. Once autumnal weather and snow started coming around in October and November, transportation grew more difficult, daylight hours waned, fresh produce was far more difficult to come by, and the rainwater for bathing that she had captured in simulation was unable to be warmed by solar energy at all.

Such seasonal difference in relative ease versus relative difficulty of energy use is generally experienced by everyone, though on differing scales. Space heating typically requires the largest percentage—about 24% or more[13]—of all energy consumed (Eagen 129). And an individual might consider heating to be non-negotiable, as anyone who has experienced a regular sub-zero-degree Minnesota winter might attest. Other activities, though, might be considered negotiable—as in waiting to turn on the heat until it is absolutely unbearable or choosing to live without air conditioning in a climate that does not reach extremely hot temperatures. These seasonal differences led me to consider our anxiety levels when it comes to energy use. In the winter, energy use might inevitably be greater, contributing to a seasonal high tide of resource use and an accompanying higher degree of anxiety for the sustainability-minded. In summer, a consumption-reduced lifestyle might be easier, contributing to a seasonal low tide of resource use and an accompanying decrease in anxiety levels.

TOWARD A HUMANISTIC EXPLORATION OF MULTIPLE FACTORS

In her aforementioned theoretical approach to information design, Drucker makes a clear distinction between what she terms a *graphic approach to humanistic expression* and a *humanistic approach to graphical expression* (Drucker, "Humanistic Approaches"). Common approaches to information design consider such factors as time and space as

12 Note: Eagen was unable to use actual rainwater because she was unable to filter it at her rented apartment. She thus gave herself a water budget through a simulation in which she filled a rainwater barrel with the average amount of water that fell in Minnesota at that time.

13 Some estimates put space heating as high as 31% (http://michaelbluejay.com/electricity/howmuch.html).Eagen provides a more detailed breakdown of energy required to heat water and space here: http://100dayswithoutoil.blogspot.com/2011/01/day-99summary-heating-cooling.html.

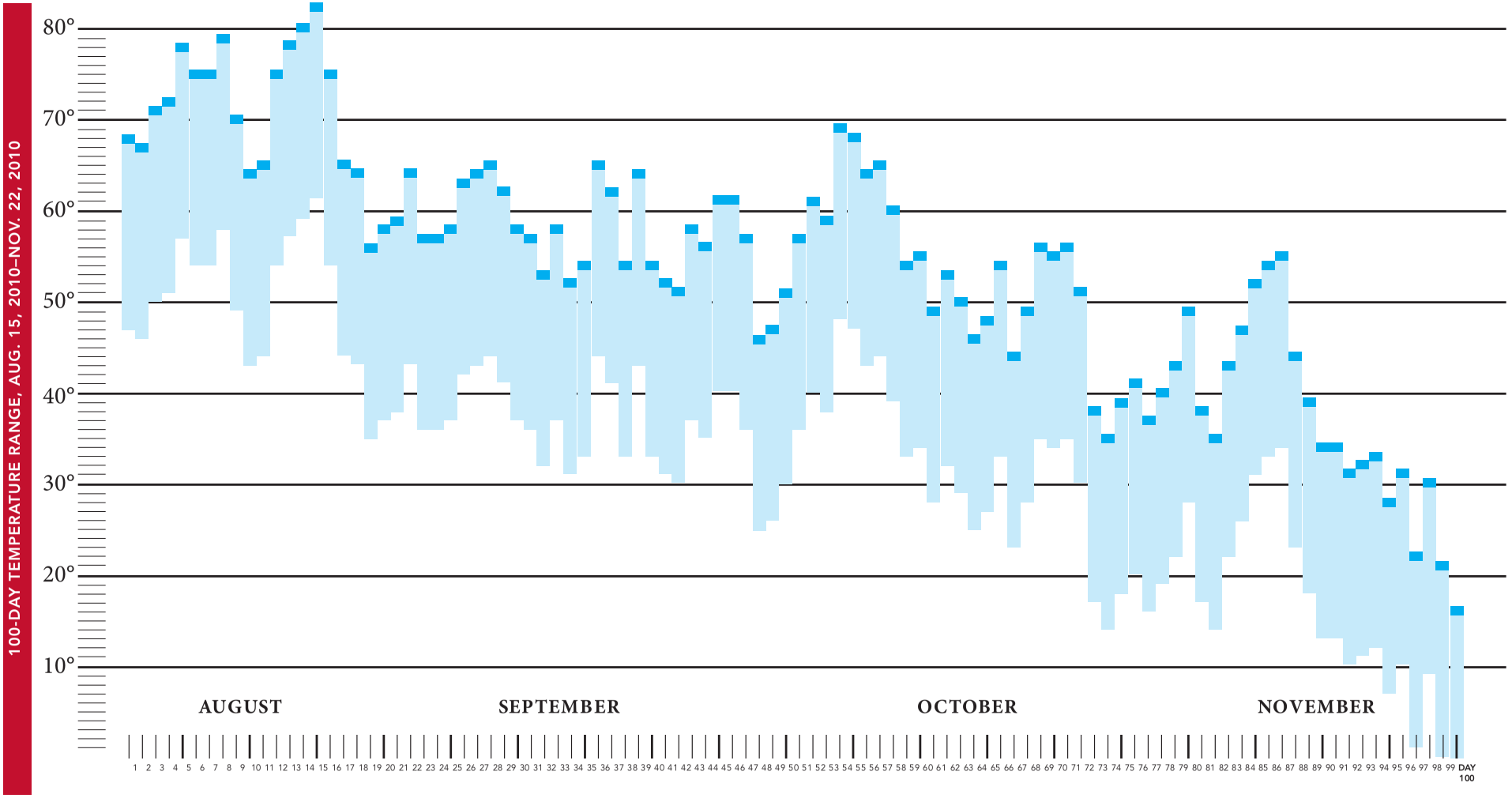


Figure 27. Timeline of the daily mean temperature of all 100 days of Molly Eagen's *100 Days Without Oil* project, between Aug. 15 and Nov. 22, 2010. Mean temperatures from weathersource.com. Design by Maggie Sattler.

factual evidence, fixed and given. I created a timeline of Eagen's *100 Days Without Oil* project, which lasted from Aug. 15, 2010, through Nov. 22, 2010, and recorded the mean temperature for each day. I mapped out each day on a horizontal axis and each day's corresponding mean temperature on a perpendicular axis (Fig. 27). Taken as a whole, this graphic tells us that the temperature between Day 1 and Day 100 gradually declined. It's rather unsurprising that the Minnesota temperature between August and November would decline and, taken without context, this is a rather dull piece of information.

I then assigned a perceived level of difficulty to each day as recorded on Eagen's blog and evidenced by her recorded outlook, demeanor, and mood. It would be a scale of 1–20 in which 1 would be the lower end of the spectrum (perceived increased anxiety and/or obstacles to face) and 20 the higher end (a happy and positive outlook, obstacles overcome). The scale is interpretive and subjective, one day's recorded level having been influenced by my reading of previous day's record, and performative in the sense that my interpretation of a single day's level of difficulty can be different from another person's interpretation based on any number of situational factors. The way in which I read Fig. 28 (and granted, reader, you are free to draw your own conclusions) is that morale for the project was generally high. There were a few difficult days in its beginnings when Eagen was adjusting to a different diet (notably, 54 out of the 100 daily posts focus on food); an otherwise upbeat outlook throughout the rest of August and September; bigger fluctuations in difficulty level in October when the weather grew colder; and more fluctuations in November, though the project ended on a high note.

I remained concerned that Figs. 26 and 27 depict a *graphic approach to human expression*; I had standardized a nonstandard metric. In order to approach information design with more attention to the performative nature of the interpretation of experience—to reach a *humanistic approach to graphical expression*—I mapped out what Drucker has termed temporal "tides."[14] She explains that a day in which one wakes up and has plenty of time to prepare for one's daily routine without having to rush or worry about being

14 See: http://video.mit.edu/watch/humanistic-approaches-to-the-graphical-expression-of-interpretation-9596/ around the 34-minute mark.

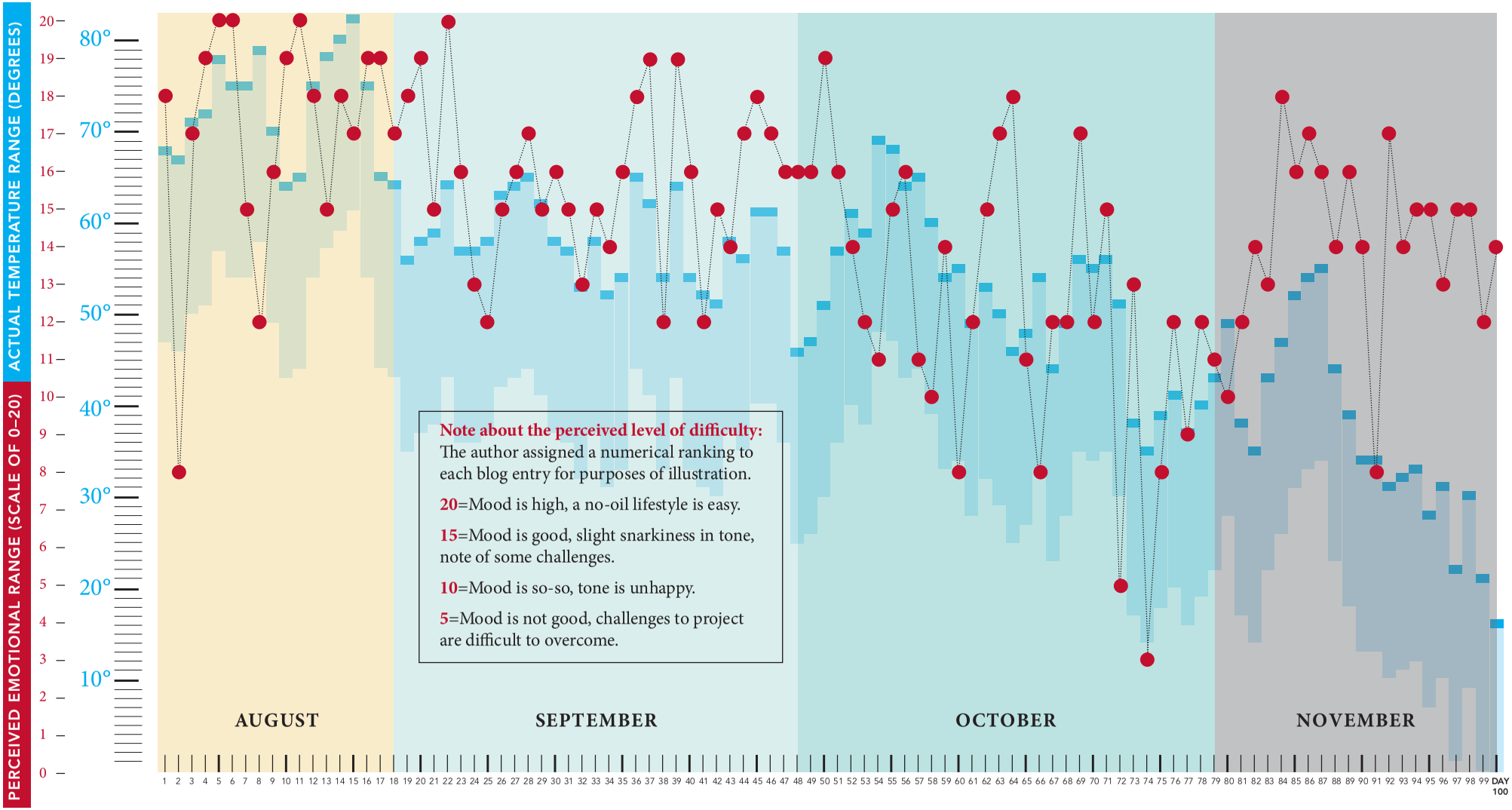


Figure 28. Timeline of the daily mean temperature of all 100 days of Molly Eagen's *100 Days Without Oil* project, between Aug. 15 and Nov. 22, 2010, mapped out with corresponding perceived level of difficulty for each day on a systematic yet subjective scale created by the author. Design by Maggie Sattler.

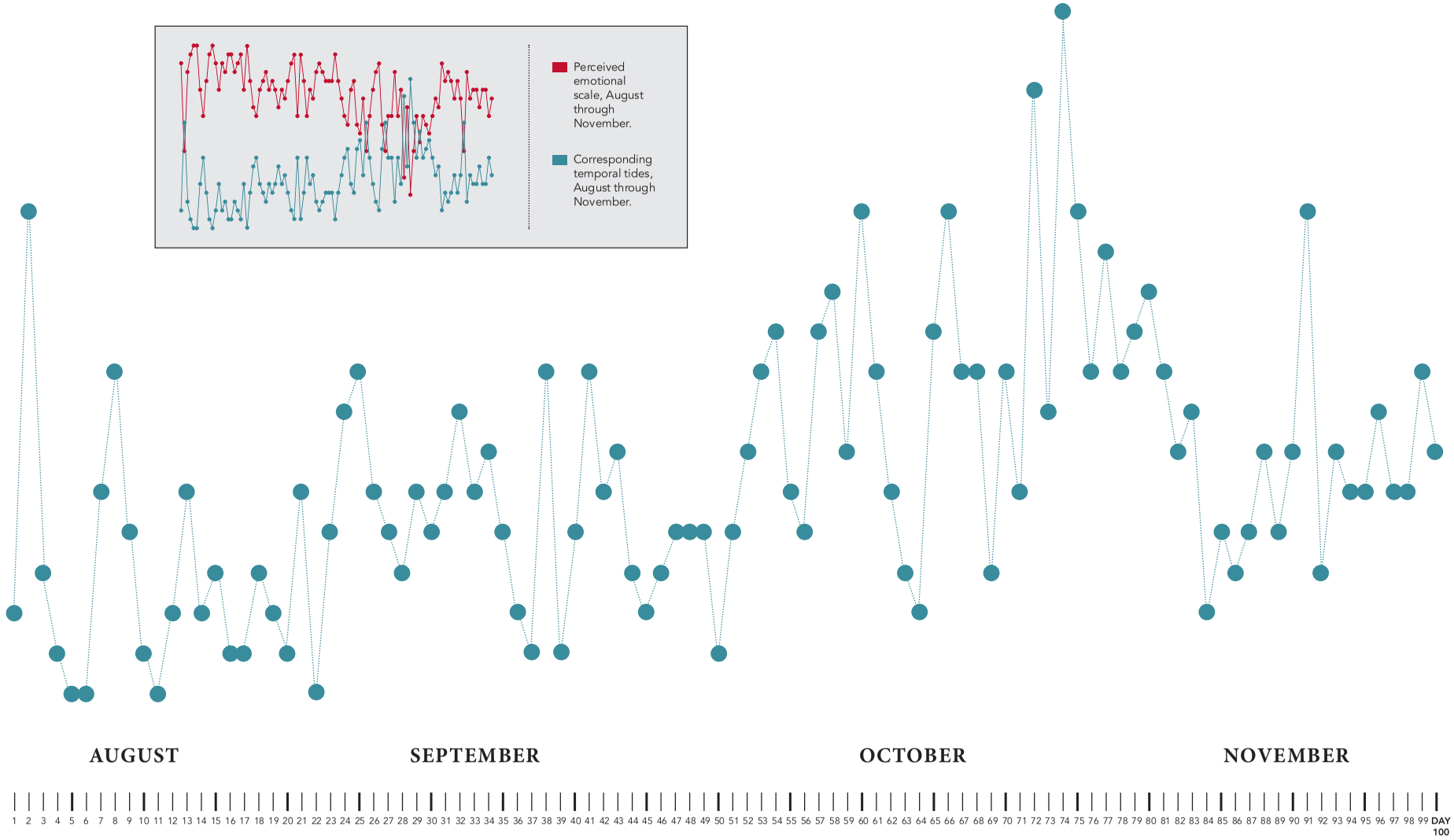


Figure 29. This timeline flips Eagen's emotional scale as perceived by me to determine days with a temporal low tide and those with a temporal high tide. "Tides" taken here represent days in which the extreme sustainable lifestyle is more difficult (high tide) or not as difficult (low tide) to achieve. Design by Maggie Sattler.

late would be deemed a low-tide day. Conversely, a day in which one wakes up late and whose day will henceforth be marked by the rush to get oneself oriented in a hurry and rush to get somewhere on time would be considered a high-tide day.

I applied Drucker's approach to temporal tides to my perception of Eagen's daily emotional scale (Fig. 29). Days in which the numeric scale was lower were deemed more difficult and thus high-tide days. Days in which the scale appeared higher were deemed less difficult and thus low-tide days. This presentation got me closer to my goal but also makes assumptions about the nature of time, in which a day is a fixed entity with a specific emotional constant. I would need to figure out a means of breaking this down further, with the effort of making time, as Drucker would say, "situated, partial, and constitutive" (Drucker, "Humanities Approaches," 3). I am going to make an essential shift here from considerations of *my perception of Eagen's experience* (which have resulted in a *graphic approach to human expression*) to my perception of Eagen's experience *as it would apply to my daily routine and with regard to my past experiences* (with intentions of a *humanistic approach to graphic expression*). At its essence, it is a shift from *data* to *capta*.

Temporality and tides

Eagen created a graphic that contrasts her daily schedule before the project with her daily no-oil schedule (Fig. 30). Notably, the two schedules aren't very different. Food preparation and transportation are two activities that take longer and cut into her study time by two hours; still, she notes that her modes of transportation (bicycling and walking) have eliminated her need to go to the gym. And despite this time distribution, the basic makeup of her days between the two schedules remain, interestingly, quite similar.

In a 2011 article for *Digital Humanities Quarterly*, Drucker observes that not all measurements of lived time are experienced in the same way and to the same degree of intensity. Drucker positions *time* as *temporality*, in which:

> *Temporality = time as a factor of X* where *X* is any variable (fear, speed, anxiety, foreshadowing, regret, reconsideration, narration, etc.). (3)

Time didn't appear to be a major source of agony for Eagen's project. Temporality did—

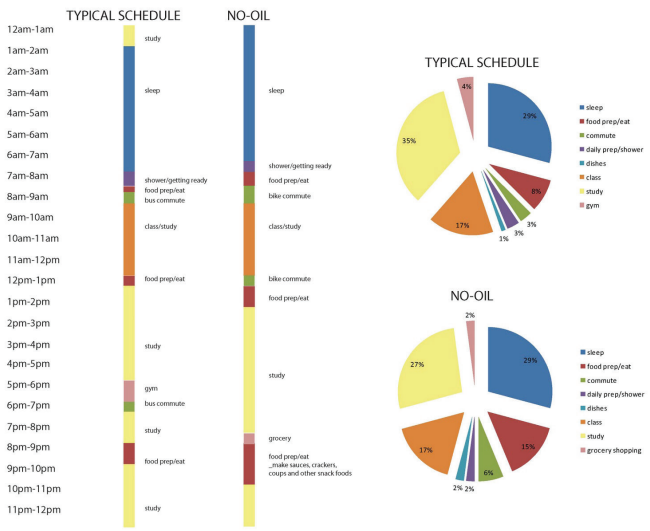


Figure 30. Eagen contrasts the daily routines of her typical schedule with those of her no-oil schedule. Source: http://100dayswithoutoil.blogspot.com/2010/10/day-54daily-time-use.html

in which lived time is a factor of the temperature (which is fixed [*x*]) and level of difficulty, as perceived by me (which is interpretive [*y*]) (as depicted in Fig. 28). With regard to daily energy use, it is also essential to be aware of activities of energy consumption that are subconscious (heat is on while you're sleeping, for example) and conscious, which comprises every daily decision we consciously make, including turning on the lights, bathing, transportation, food purchase and preparation, plugging in electronic devices, warming up water for tea, flushing the toilet, bringing reusable mugs and cloth grocery bags to relevant places, and so forth.

Fig. 31 makes an attempt to tell this story with regard to my perception of my own daily lived experience on a common workday. I've marked those times of day in which I am faced with making a conscious decision about resource consumption and correlated those with a self-perceived level of relative ease or difficulty of making those decisions on an extreme- and a moderate-weather day. Then, because space heating and space cooling are constant sources of energy consumption that are, in my household, considered non-negotiable in extreme-cold and extreme-hot weather, I've mapped these separately. Combined, space heating and cooling make up around 40% of the average residence's

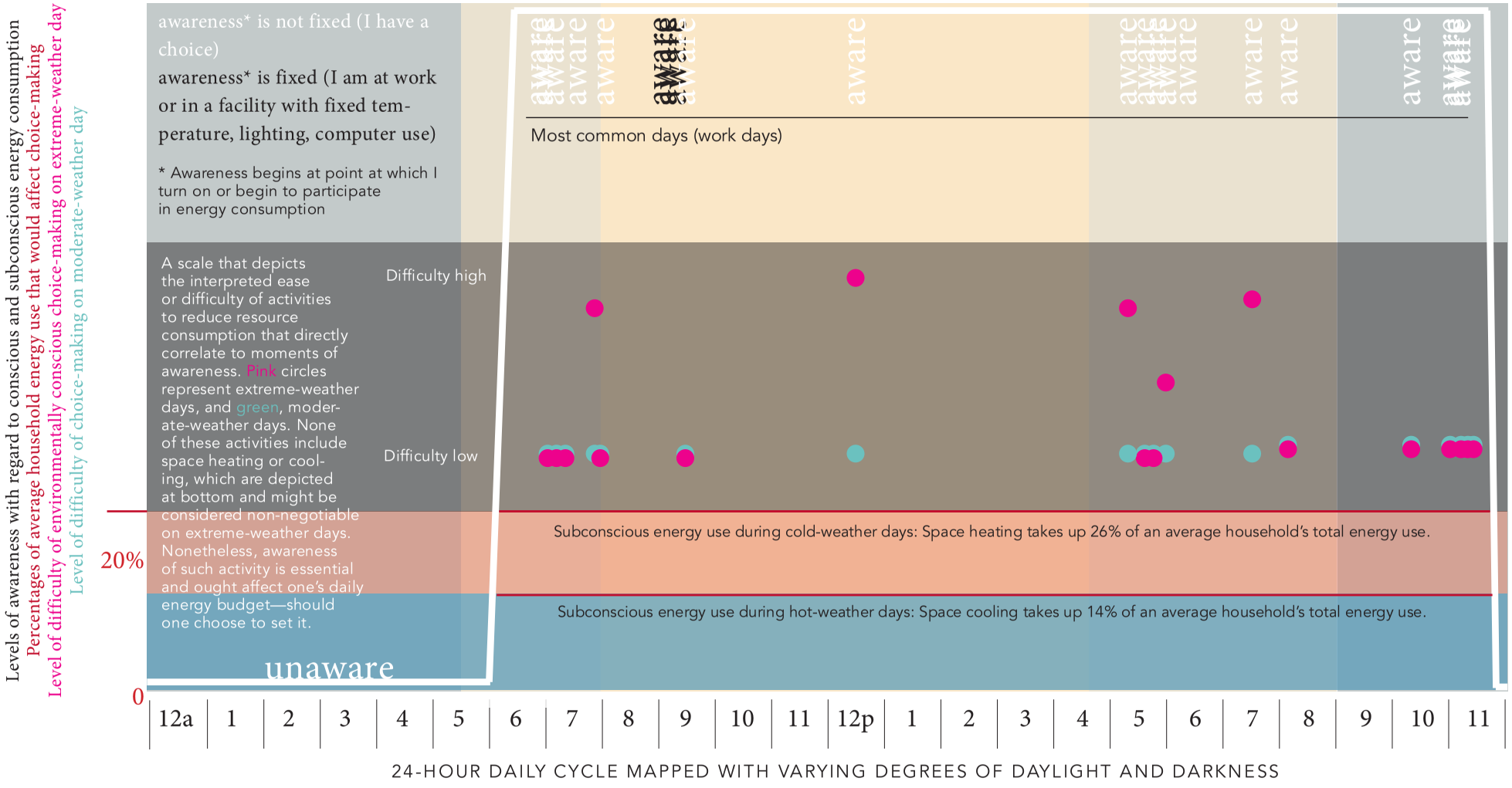


Figure 31. This graphic shows three key pieces of information: (1) space-heating and space-cooling are often non-negotiables that do not always factor into our daily choices but their existence nonetheless ought to affect one's daily choices toward exponential lower energy consumption; (2) it depicts the specific points during my daily routine in which I have awareness that I have a choice to make about a sustainable or energy-consuming habit; and (3) my ability to make those choices and discern their perceived levels of difficulty or ease are different, on some accounts, on an extreme-weather day than it would be on a moderate-weather day. Design by Maggie Sattler.

energy consumption (by Eagen's report (129)). My thoughts are that such non-negotiables and their seasonal variations need to be accounted for. For example, a decision to reduce water consumption by taking shorter showers might be crucial on a general basis, but becomes even more crucial in the winter, when so much more energy is used for space-heating.

For purposes of humanistic inquiry, it might seem counterintuitive to map numerical averages (with regard to space heating and space cooling) with subjective states of awareness and perceived level of difficulty. My goal is in getting toward a state of synthesis, and in order to do so, I resolved that some degree of standardization was necessary. I observed that most decisions regarding energy use were relatively low on the difficulty scale for my moderate-weather days. On extreme-weather days (in my case, most winter days), I ranked food, transportation, and bathing as activities that would be more difficult to carry out to Eagen's oil-absent extreme. The act of pinpointing what would be most difficult inevitably gave me a better handle on the simpler decisions I could make with potential to offset the environmentally unfriendly ones.

Inasmuch as the use of standard metrics was deemed necessary with regard to the use of hours in a day, some degree of abstraction was also deemed necessary. I purposefully chose to document times throughout the day when I was making a conscious decision with regard to energy use, and I purposefully chose not to be specific about what each decision was. I meant for the focus to be on the time and the level of difficulty; to bring more specificity to the particular activity I was referencing would seem to me to give the design a tendency toward automation, suggesting that said activity would certainly be performed at that level of awareness and that level of difficulty every time it was performed. For example, finding local food on a warm and moderate-weather day might be perceived to be an easy task, but what happens if I forgot my wallet at home? My anxiety level will grow, and this will be an outlier day but nonetheless part of my experience. So energy-consuming activities are presented in Fig. 31 in their inherently abstract form because they are inherently uncertain.

Fig. 31 finds different ways to represent my states of awareness. It is a 24-hour cycle

in which unconscious uses of energy (such as when the heat is on while you're sleeping) are suggested, so that the conscious uses of energy and decisions we must make each day become more significant. Each activity in which I willingly participate that uses up energy has representation on this graphic. At the very top, I document activities of which I am aware with varying intensity; I have a bus pass, so it's likely I'll take the bus, for example; the choice has already been made. These types of activities are marked by a black "aware." But what I do for lunch and the container in which I carry my lunch changes every day, and I have more flexibility to alter that activity every day. These types of activities are marked by a white "aware." As evidenced, I have far more fluid choices to make than fixed ones.

These markers of awareness are also punctuated not just by how much of a choice it is to consume a particular amount of energy, but also by how difficult the decision to make a sustainably minded choice is for me. The transparent black part of the graphic punctuates these choices on an extreme-weather day, in which several of them are quite difficult (as marked in pink), and on a moderate-weather day, in which all are relatively easy (as marked in green). These markers tell another story when it comes to energy use. They also bring the graphic closer to a representation of temporality by inflecting each activity with a perceived level of difficulty by the person who is experiencing it.

All told, the presentation isn't perfect or complete. I believe more attributes could be added to take situational humanistic elements even further, such as accounting for weekend days or mapping the point of view of a family with young children. The format, too, had its own limitations; I was designing for a letter-size, static publication. An animated game or a smartphone application might lead to new opportunities for emissions documentation. For example, applications exist for which individuals can track their net calories consumed per day. Daily calorie budgets are set with regard to a user's health goals. Food consumption eats into the budget; exercise brings that budget back up. What if a person could set daily carbon emissions goals for him- or herself? This is an opportunity I would love to explore, had I but world enough, time, and ability. Lack of skills aside, my hope is that these static presentations function to further the conversation about humanis-

tic expression and global goals.

SYNTHESIS

Just as the RII is a collective story of one population sample's metrics of energy consumption, so a humanistic exploration of the data can lead one to understand one's own role in the collective. The documentable actions of the individual or household that are rooted in nonstandard metrics inevitably contribute to the standard metrics of the collective. It is important that we explore situational contexts of the household in any humanistic inquiry into energy use.

Throughout the span of this project, I had had abstract goals but no specific directions in terms of deliverables. I knew I wanted to explore a complex problem through information design. I had hoped to produce deliverables that contributed to the edification of a community in some way. As I sought to gain a better understanding of that community's needs, though, I discovered just how complex the question of energy use is, and there was no simple way to create a single information design that was applicable to a large group when so many variables were at stake.

Collaboration with stakeholders was an important contribution to my own thorough understanding of the question I was exploring. I met with all of my stakeholders in face-to-face meetings, and definitely gained more from these interactions than I believe I would have via electronic communication alone. Their input was crucial to ensuring my information exploration was accurately informed. In this case, the city of Falcon Heights didn't have specific expectations, which afforded me a rare flexibility that allowed my project to evolve as it might. In the case of the Resilient Communities Project, collaboration was crucial for establishing and meeting the city's expectations as the project progressed into its subsequent steps.

Boundary knowledge also figured in significantly in my exploration of energy use. Because I was open to exploring connections whose relevance was not immediately apparent, I wound up immersing myself in Eagen's no-oil universe. Her project inevitably played a large factor in my project's outcome.

Temporality, too, was an instrumental concept to emerge from this project. The acknowledgment of its existence unearthed underlying assumptions I had had about the nature of time and its representation. When time is standardized in hours, days, weeks, and so forth, we might forget that it can exist outside of these boundaries. Its measurement might be standardized, but each individual's lived experience with it is not. One day in the future, there may be a more intuitive way to represent temporality, or time with inflection. In the meantime, for purposes of this project, a focus on temporality not only provided a greater understanding of Eagen's lived experience, but also has the potential to contribute to a greater understanding of the designer's process.

PART III:
TOWARD AN EXPERIMENTAL MODEL OF INFORMATION DESIGN THINKING

The purpose of Part III is to demonstrate the design thinking and digital humanities processes of building through the creation of a new model of humanized information design thinking. This new model is rooted in the author's information design experience. It is based on models of design thinking and on digital humanities theory, which will be explored in this chapter.

CHAPTER 4: INFORMATION DESIGN, REHUMANIZED

To introduce the element of standardized time into design-thinking methodology would only augment such models' tendencies to be rigid and linear in structure. But to introduce the element of *temporality* into the design-thinking process would ensure a heightened representation of the designer's process. Where *temporality = time as a factor of [x]*, each lived experience of time spent working through the problem-solving process is inflected with different variables with regard to emotions, experience, level of difficulty, season, time of day at which it is applied, and so forth. Each act of problem solving is inflected. Each step in the problem-solving process is inflected. Even if a designer follows a model of design thinking, his or her unique application of said model is not automatic, objective, or even necessarily repeatable, and will differ from designer to designer. The challenge here is to develop a loose model that provides *direction* without *prescription*.

My proposal for a model of information design involves a loose hybrid of the models and case studies previously discussed. It is a *Model of Humanized Information Design Thinking.* I consider that in some cases it *rehumanizes* information design because all information originates with human experience and perception. Every piece of data, whether it is a temperature, a day of the week, or a numeric value, has been designed so as to be systematized. At its genesis, information is humanized; in the systematization process, it loses its innate human-ness. This model represents an attempt to re-insert that humanized nature back into information design, hence its goal is to *rehumanize* information design.

Notably, this model is not applicable to all instances of information design. In the sense that not all problems in need of solutions require the full design-thinking treatment,

it is the complex problems without a single answer that will be conducive to this model. Energy use is one such example. The question of whether to create neighborhoods in a suburban city is another such example we've explored—it requires a process that will account for a diversity of available variables. This model of humanized information design thinking aims to address complex problems for which information design can not only *represent* but also *generate* a solution. It is modifiable, it is not step-by-step prescriptive, and it makes an attempt to account for the element of inflected time.

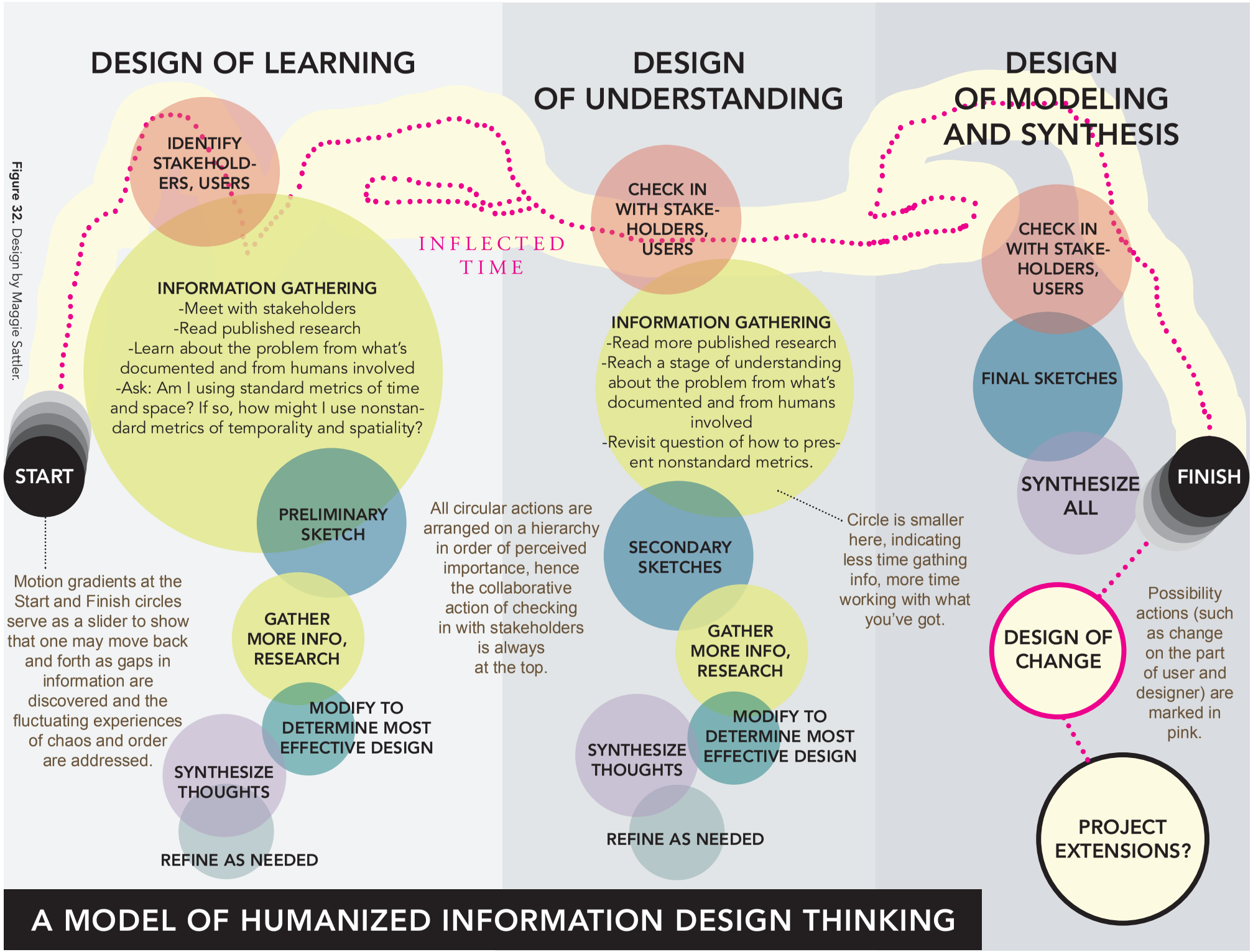


Figure 32. Design by Maggie Sattler.

A MODEL OF HUMANIZED INFORMATION DESIGN THINKING

THE NEW MODEL'S PRINCIPLES

The model of humanized information design thinking is comprised of several primary principles that design thinking models do not explicitly account for. Each of these principles was applied in Case Study 2, and will be analyzed here.

• **Design of learning.** The fundamental first phase of any given project. Often in the design process there is such a strong urge to create that one doesn't concentrate as much on the need to learn. To take the time to learn surrounding issues of a problem ensures that one's designed solutions will absorb as much crucial content and context as possible. As such, the learning process is, by design, distinctly represented in this model.

The activities of identifying stakeholders, information gathering, preliminary sketching, and modification and refinement, are all initially engaged for the sake of learning. Preliminary sketches will contribute to the final outcome, but they won't *be* the final outcome. Each of these activities gets us closer toward the ultimate goal of humanized information design, though it's important to recognize that these will require a significant amount of time for the sake of learning and immersing oneself in a project's context.

In Case Study 2, I had set out to create a solution to a problem through information design, though I wasn't sure what type of problem would take shape. My thesis adviser introduced me to the Falcon Heights city government team, which led me to the Regional Indicators Initiative, which led me to the design team at LHB, Inc., which led me to Molly Eagen's *100 Days Without Oil* project. It was only after meeting with all of these stakeholders and reading materials they gave me that I had a clear idea about the problems I was going to tackle: climate change and humans' daily activities that affect it. Collaboration was key to information gathering and empathy gaining, which were both important elements in my learning process.

• **Design of understanding.** To undertake to learn is one thing, and the process of understanding, another. Critically, the *design of understanding* requires an entire revisitation of all activities included in the *design of learning*. The information gathering activity is depicted in a smaller circle to indicate that the bulk of the gathering will have taken

place in the design of learning stage. In the design of understanding stage, the designer applies what was learned. The designer's secondary sketches will be more refined than the preliminary ones, and so will the activities of synthesis and reiteration.

In the *design of understanding* process with regard to Case Study 2, I had identified and met with more stakeholders that I discovered after the *design of learning* stage, including environmental policy professional Megan Hoye and the Falcon Heights Environmental Commission. I also identified Eagen as a stakeholder whose project would assume a larger role in my thesis than I had initially calculated. All of these stakeholders pointed out errors in my initial logic. I took this new information to heart and discovered how truly difficult it would be to perform a humanistic inquiry if I didn't learn to think beyond the standard metrics of energy use.

I chose to pause my exploration of kBtus and move on to the nonstandard metrics of experience recorded in Eagen's daily blog. This record of Eagen's experience influenced me to draw conclusions about the victories, the defeats, and the moods that accompanied her on the path to extreme sustainable living. Both the blog and Colin Beavan's book *No Impact Man* provided me with the human perspective I needed from those who lived it. What I discovered had helped me to even better understand the broader problem of nonrenewable energy dependence.

Throughout this process of understanding, I also had to understand how best to theorize and represent this problem with some sense of clarity. Drucker's published materials were plenty useful in pointing out the need for a new approach to time as temporality. I applied her idea of low-tide and high-tide senses of time to the representation of Eagen's 100-day project. This allowed me to pinpoint some assumptions I had brought about how our experiences of time play into our experiences with nature, location, and the planet. Drucker's theory gave me a sense of confidence that I could tackle this problem in some way, though not in the way I had initially set out to.

- **Temporality.** The *Model of Humanized Information Design Thinking* uses a time "slider," which is adapted from the concept of the "now-slider" created by a team led by Drucker for its Temporal Modeling project. As Drucker discusses in *SpecLab*, the

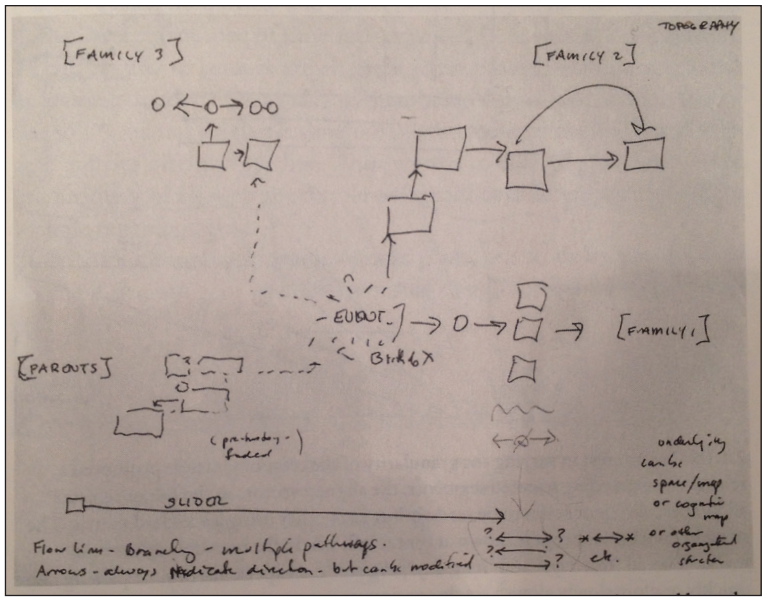


Figure 33. Shot of Figure 2.1.1: Preliminary design sketches for Temporal Modeling from *SpecLab* by Johanna Drucker (page 53).

"now-slider" would allow forward and backward movement in the attempt to treat time as non-linear. Drucker's team's model includes a system of branching narratives (Fig. 33) that can move forward and backward in time, acknowledging that past events might be understood differently as new information arises and, concurrently, the anticipation of future events might shape the present. The slider's presence challenges the idea of time as unidirectional and functions as a new representation of the means with which we catalog, remember, and anticipate experiences of time.

In the model of information design thinking, the slider's function is similar in the sense that the information designer or curator is always moving forward in time, but may move backward or forward among steps as new information and experiences are gained. Its presence implies that anticipation of future events or the memory of past events might encourage backward or forward movement as new information surfaces.

I designed the experience of inflected time with regard to Case Study 2 on this model, not on a straight time continuum but on an inflected slider that represents my perceived levels of anxiety throughout the project. When I had the least amount of information available, anxiety was highest. As I grew more confident in my ability to understand the

problem I was going to solve, my anxiety level decreased a little. Generally, the level of anxiety is heightened because with this project, a lot was at stake for me since it had formed the bulk of my masters thesis.

Importantly, the model's representation of temporality is representative of my experience. Unlike other parts of the model, it does not make suggestions for future iterations of information design thinking. The mere existence of a model of thinking, any model, assumes a human being has not only used it, but used it in a manner they consider successful. Steps by themselves are not humanized. The slider, which serves to represent my experience, is what humanizes the model. In so doing, content follows form in the sense that this model encourages the creation of a humanized product while simultaneously being humanized in itself.

- **Importance of boundary knowledge.** This principle involves an attention to one's own intuition and ability to seek connections even when the utility of such connections is not immediately known. All life experiences have the power to inform and inspire and ultimately contribute to the end result of a project to some extent. A successful design is one that has changed or affected the designer in some way, and it is often through exposure to contextual boundary knowledge that a clear contextual understanding can take place.

- **Ultimate engagement of the end user.** This principle *is* explicitly included in design thinking models, though nonetheless important to note here. In *Information Design*, Mike Cooley outlines nine characteristics crucial to systems design. Among these, inclusiveness, engagement, and ownership are included, all of which are, significantly, user-based. An information design model should also adopt these characteristics, which appear in the model as the actions of checking in with stakeholders and users (inclusiveness); engaging those stakeholders and users in an attempt at information gathering to the point of creating empathy (engagement); and gathering more information and refining previous actions as needed, allowing the user the opportunity for a stake in the process by encouraging feedback (ownership).

- **Collaboration.** Identifying and engaging all relevant stakeholders is an important

step toward gauging the broader goals and desires of a project. Multiple stakeholders might have diverse reasons for becoming invested in a project; in Case Study 2, for example, it was deemed that face-to-face meetings with the city government, the architecture firm, the student, and energy professionals were necessary to engaging all facets of a complex project. Each meeting was significant and shaped the outcome of the project in some way; some even pointed out errors in my logic that I would not have recognized otherwise. Still, each project will require differing levels of teamwork. A journalist's project to visualize shortcomings on the part of a specific organization, for example, will not require collaboration of that organization, which would try to censor bad press. Such a project would, however, require collaboration on the part of other teams including the design and editorial teams to ensure the editorial and design standards of the paper are being met, and also to ensure it is meeting readers' needs.

- **Accessibility.** In her University of Minnesota Press blog post, Drucker offers examples of what she considers successful humanistic information design. These include humanized maps created by designer Yanni A. Loukissas as part of *SurfaceCities*[15] and Stuart Dunn's Motion in Place Platform Project[16]. Both of these are complicated in nature and draw upon specialized tools and knowledge to create designed objects that also require some form of specialized and contextualized knowledge to understand. Both wrestle with ideas of how we could represent time and space.

The premise of the humanized information design thinking model assumes that such tools as these complicated ones will be more accessible in the future. Free tools such as IBM's Many Eyes or Tableau or Google's Fusion Tables are already making information design an accessible practice. Such tools are likely to evolve and become more intuitive and accessible in time, becoming akin to Microsoft Word today. Still, such tools currently encourage automation, and as they become increasingly mainstream, attention to information's inherent humanity becomes increasingly important. As such, this model is meant

15 For an example, see "Angel Dust," which uses Google Earth's navigational tools to lead viewers to imagine how Robert Moses' unrealized vision for the Mid-Manhattan Expressway would have drastically altered the Manhattan of today: http://www.surfacecities.com/proj_01.html

16 See: http://sro.sussex.ac.uk/40997/1/CAA_Motion_in_Place.pdf

to set a premises for humanized information design at any level, whether a beginner learning a basic tool or an advanced designer using a complex mapping system.

• **Design of modeling and synthesis**. All projects ultimately come to an end to some extent, and it is through an understanding of one's deadline that one can move efficiently and effectively through the process of information design. We've previously looked at two different bar graphs from Drucker: One of the number of books published in a given set of years and another that takes into account years before and after a book's publication to suggest the life of a book that transcends its publication date. In this same sense, the "Finish" mark on the information design thinking model could be considered a project's publication date. Everything that comes before it is similar to the acquisitions, editing, and production processes for a book, and everything that comes after it is similar to the marketing processes and public momentum a book amasses after its publication date.

Bringing everything together in Case Study 2 proved to be tricky; bringing everything together for the sake of making it understandable for readers of this information proved to be even more tricky. I had assigned a singular mood level to entire days of Eagen's recorded experience, and realized I would have to dig deeper and assign perceived mood levels to conscious and unconscious uses of energy, as well as to different times of the day, if I were to entirely avoid generalizing. The result is such that I am still not entirely satisfied with the end products, truth be told, though I am satisfied that I have succeeded in getting myself to think about the problem differently—and so, I hope, has the reader.

• **Design of change.** Notably, additional steps are included after a project's publication date to account for a project's life after completion: the design of change on the part of both user and designer as a result of the process; and the possibility for extending the project and taking it to new and different levels. As Robert Jacobson notes in the Introduction to *Information Design*, a designer is just as likely to be changed by the process of information design as the intended user. This ability to recognize the designer not as infallible expert but as vulnerable, human, and one who has a need to learn just as much as the user as a curator of information, is significant here.

The experience of Case Study 2 inspired me to approach my relationship with energy

use differently. I have always taken public transportation or preferred walking, and these habits have been reinforced. I purchase more food in bulk, and bring reusable containers with me when shopping or eating out. I inquire of deli store managers about their policies with regard to allowing me to bring reusable containers. I pay more attention to purchasing seasonal fare, and mostly dine out at places that support local fare. I am more sensitive to my use of heat around the house, and more okay with being a little cold and using extra blankets. I also wake up two hours earlier than I used to in order to make the most of the sunlight in my day. Have I been changed by this project? Certainly. Have I pursued extensions of this project? Indirectly, yes, and I remain open to exploring the data further. Have I made an impression on my readers? That remains to be seen.

CONCLUSION

This project has been a process of discovery. We've studied design thinking models and their theoretical similarities to principles of the digital humanities. We've delved into the nature of the design of information in two case studies. And we've channeled these analyses, marrying content with form, toward the creation of a new, humanized model of information design thinking.

The process of designing information is intricate and significant. Every action in the process is exponential, present and future actions influenced by previous actions, and subjective, present emotional states building upon the emotional states applied in previous actions. At points, a designer must make difficult decisions for the sake of meeting a deadline. For these reasons, a rehumanized information design model recognizes the designer as human—not just the user. The designer is not an all-knowing, infallible person working with fixed data. In almost every instance of information design, the designer is working with capta that are flawed, incomplete, and situated, and is representing such capta with the end goal of edification. All information originates from human processes and records, and becomes dehumanized when it is systematized. The *Model of Humanized Information Design Thinking* presents an accessible way of approaching the rehumanization of information design.

In popular design thinking models, the element of temporality often gets ignored, presumably because it is too multifarious to capture and too difficult to use in any prescriptory sense. And at the same time, the absence of a record of temporality risks alienating both user and designer. A particularly insightful quote from author Michelle Orange comes to mind: "The more objective our measurements for space and time, the stronger our impulse to transcend them with a sense of personalized order" (17). The phrase *personalized order* is telling in the sense that the desire for organized time exists, though we also desire to inflect the fixed continuum with situational markers that enable time to feel different as a particular mood or event might call for. Time is designed such that it is measured objectively, yet it affects so much of human activity; minutes might move

swiftly when we're busy and alternately feel like hours when we're dissatisfied or waiting on something.

At the very core of information design's goals is to bring a sense of order to chaos, and the designer, as a human, cannot escape personalizing the process in some way. Drucker knows this very well, and at the same time she knows that intuitive, accessible tools to explore temporality have yet to surface. She has dedicated decades to the pursuit of such tools, as evidenced in the temporal modeling project she outlines in *SpecLab*, which "succeeded in demonstrating that visualization could serve as a method of creating interpretative analysis, and not merely of displaying it" (65). This same approach is applied to the rehumanized information design model: it is not just a method of representation. It is also a method of generating new ways of thinking and of creating meaning that is not inherent in capta by itself.

The rehumanized model of information design is thorough but not perfect. Drucker points out a need to fundamentally rethink the ways we interpret and represent time and space. The solution, in its application, is not a simple one, and this new model of information design thinking has merely scratched the surface of possibilities.

SUGGESTIONS FOR FURTHER RESEARCH

A distinct lack of technological skill when it comes to animation or computer programming was evident in the application of the model to rehumanize information design. There is an inherent tension here wherein my model promotes accessibility yet current examples of great humanized information design require an amount of specialized and well-developed skill and comfort level with advanced software. Until such software becomes more intuitive and easy to use, applications of a humanized model of information design will not be able to reach their full potential as well as they could with designers that have advanced skill with interactive tools. Future examinations of this model could look deeper at this tension between specialization and accessibility.

This thesis also lacks a clear idea of how information design defines success on a conventional level. The humanities would say that there is no fixed, conventional way to define success because each human giving a reading of an object will have different motivations for doing so. As such, one could say that if an object of design has stimulated a reader to think differently, it has been successful, though this is currently impossible to measure. I have volumes of books full of interesting information designs that have been published because they've been considered successful for various purposes. I also question many of those information designs on account of their purposes. Do they get me, the general reader, to think differently, or am I drawn to their aesthetic value more than anything? Further iterations of this project ought to delve into the ways in which designers define successful outcomes for humanized information design.

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